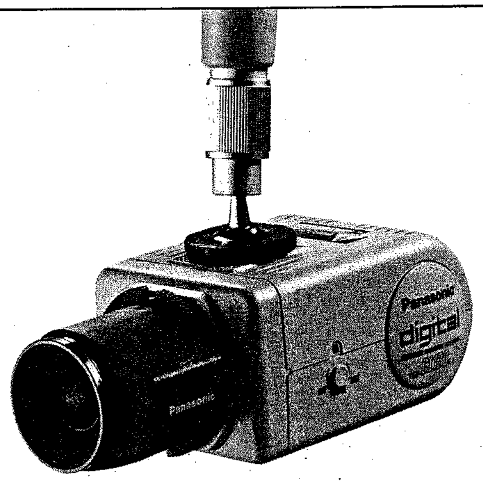
ORDER NO. AVS9205574C8

Service Manual

Colour CCTV Camera

WV-CL120



SPECIFICATIONS

Pick-up Device :	681 (H) × 582 (V) pixels, Interline Transfer CCD
Scanning Area :	6.6 (H) × 4.9 (V) mm (Equivalent to scanning area of 1/2" pick-up tube)
Synchronization :	Multiplexed vertical drive (VD2) by use of specified camera drive unit.
Scanning System :	2 : 1 interlace
Scanning :	625 Lines/50 fields/25 frames
Horizontal :	15.625 kHz
Vertical :	50 Hz
Horizontal Resolution :	430 lines
Video Output :	1.0 Vp-p composite, 75 ohms
Signal-to-Noise Ratio :	44 dB
Automatic Light Compensation :	ALC : 1 : 12,000 with F1.4 ALC lens, AGC ON
Electronic Light Control :	Equivalent to continuous variable shutter speed between 1/50 sec. and 1/15,600 sec.
Minimum Scene Illumination :	3 lux at F1.4, AGC ON
Recommended Scene Illumination :	140 lux at F1.4
Automatic Gain Control :	Selectable ON (+14 dB) or OFF
Lens Mount :	Special C-mount (CS-mount)
Maximum Cable Length :	200 m with RG-59/U (3C-2V) or 500 m with RG6/U (5C-2V)
Power Supply :	To be supplied from the specified monitor, camera extension unit or camera drive unit.
Ambient Operating Temperature :	−10°C - +50°C
Ambient Operating Humidity :	Less than 90%
Dimensions (without lens) :	73 (W) × 58 (H) × 118 (D) mm
Weight (without lens) :	0.38kg

Weight and dimensions indicated are approximate.
Specifications are subject to change without notice.

Panasonic

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Most of the circuitries adopted in WV-CL120 are quite similar to WV-CL350. Refer to WV-CL350 service manual for the circuit description.

⚡ **CAUTION** ⚠
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USERSERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

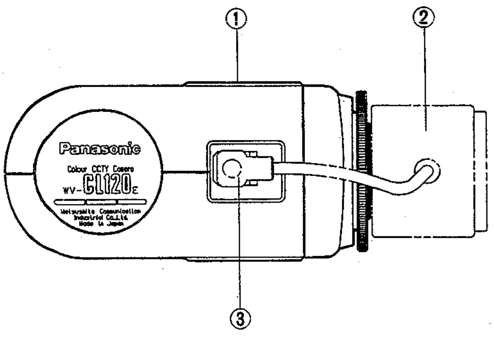
⚡ This symbol warns the user that uninsulated voltage within the unit may have suificient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.

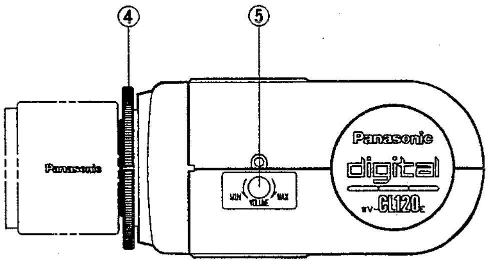
⚠ This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included.
Therefore, it should be read carefully in order to avoid any problems.

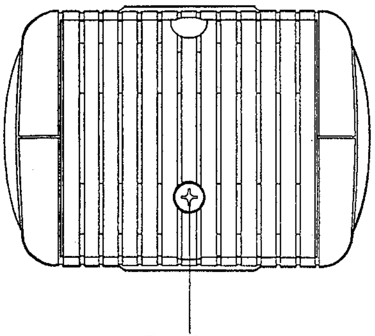
IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are indicated by the "⚠" mark on the schematic diagram and the replacement parts list. It is essential that these critical parts should be repleced with manufacture's specified parts to prevent shock, fire, or other hazards.
Do not modify the original design without permission of manufacture.

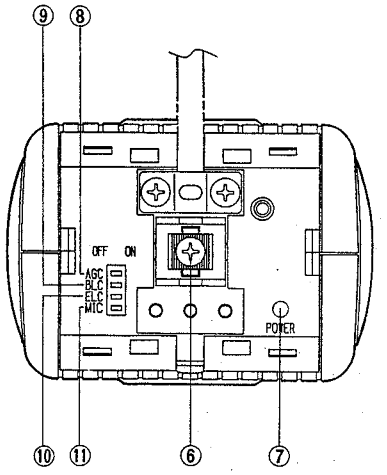
MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS







Rear Cover
Fixing Screw



(1) Camera mounting Screw Hole
These threaded holes (1/4" - 20) are located on the top and bottom cover and are used to mount the camera onto a mounting bracket or tripod.

(2) Lens (Option)
See page 9, 10 and 11 for details on lens selection. Standard C-mount lens can be used with the camera by use of optional lens mount converter (C-mount adaptor) WV-AD20.

(3) Auto Iris Lens Connector
This 4-pin connector supplies the power and DC control signal to the auto iris lens.

(4) Flange-back Adjusting Ring
This ring is used to adjust the back focal length or picture focus by rotating this ring.

(5) Volume Control (VOLUME MIN/MAX)
The volume control is preset in the MAX position at the factory. Adjust this control to prevent the howling.

(6) Video Output Terminal
This terminal is used to connect a coaxial cable to the CAMERA INPUT of specified monitor or camera drive unit, and accept DC power and vertical drive pulse, and supplies audio and video output of the camera.

(7) Power Indicator

(8) AGC ON/OFF Switch (AGC ON/OFF)
This switch is used to select the gain of the video amplifier as follows :

ON :
The lens iris is fully opened at low light shooting, a clear picture is obtained by automatic increase of the gain.

OFF :
A natural and low-noise picture is obtained under a low light condition.

(9) Back Light Compensation ON/OFF Switch (BLC ON/OFF)
When back light affects the picture, set this switch to ON position for a clear picture. See page 7 for more details.

(10) Electronic Light Control ON/OFF Switch (ELC ON/OFF)

See page 6 for more details.

OFF :

Choose this position used with auto iris lens.

ON :

Choose this position used with manual or fixed iris lens.

(11) Microphone ON/OFF Switch (MIC ON/OFF)

Select this switch in need of on or off.

NEW FUNCTIONS

1. ELC (Electronic Light Control)

In this mode a continuously variable electronic shutter is employed to automatically control exposure times in the CCD Image Sensor, according to the incoming light level. With this mode selected, fixed or manual iris lens can be used instead of an ALC type lens.

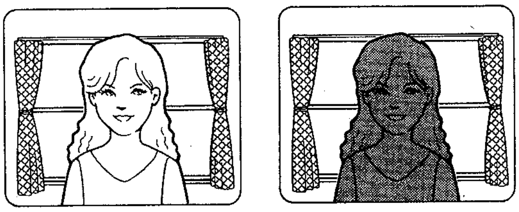
Caution :

1. Under bright conditions such as outdoors, use an ALC type lens as the ELC control range is not wide enough under these conditions.
2. Under certain unique lighting conditions, the following may appear :
   - Strong smear and/or blooming on high light objects such as spot lights or windows.
   - Noticeable flicker in the picture and/or the colour rendition variations.
   - Periodic variance of white balance

   Should these phenomena occur, use an ALC lens.
3. When using in the ELC mode with a fixed iris lens, the depth of field of the image may be less than that obtained by using an ALC lens. Depth of field varies inversely with the iris opening.

   Thus, using this camera in the ELC mode with the fixed iris lens fully opened will result in less depth of field than if an ALC lens was used. (And distant objects in the picture might not be in focus.)

2. BLC (Back Light Compensation)



ON OFF

When strong, unwanted background lighting interferes with the clarity of important scene objects, turn this switch to the "ON" position.

Cautions :

1. Setting this switch to the "BLC OFF" position is recommended in the use with the pan/tilt head or in the object having the rapid change illumination, since the speed of lens iris becomes slow in the "BLC ON" position.
2. If the desired objects are not in the center of the picture, back light compensation may not work effectively.

About Your Computer

In order to run the E.V.R (Electric Variable Resistor) adjustment program your IBM-PC (PS2 or AT type) or compatible must meet the following requirements:

- The DOS Operating System must be 3.3 or higher.
- The Operating System must be 100% compatible with your computer.
- The memory in your IBM-PC must be at least 640K-bytes, and 512K-bytes shall be available to the E.V.R adjustment program.

Installing E.V.R Adjustment Program

- The Example given here is for A 2 drive computer, your procedure might vary slightly depending on drive configuration.
- Formatting new disk and making a copy of DOS Operating System

a) Insert disk containing DOS operating system into your floppy drive (for example, drive A) and type **A :**
b) Insert new disk into your floppy drive (for example, drive B).
c) Format and make a copy of DOS operating system from your original disk to new disk by typing **FORMAT B : / S** and press **ENTER.**
d) Type **COPY ANSI. SYS B :** and press **ENTER.**

- Install E.V.R Adjustment Program onto formatted new disk with DOS operating system.

e) Take out original disk containing DOS operating system from your floppy drive (drive A) and insert disk containing E.V.R adjustment program into your floppy drive (drive A) and type **A :**
f) At the prompt, type **CD IBMPC** and press **ENTER.**
g) If required, type **COPY CONFIG. SYS B:** and press **ENTER.**
h) Type **CD PAL.**
i) Type **COPY ADJS. EXE B :** and press **ENTER.**
j) Type **CD ** and press **ENTER.**
k) Type **CD SEQ** and press **ENTER.**
l) Type **COPY CL120E. SEQ B :** and press **ENTER.**
m) Type **CD ** and press **ENTER.**
n) Type **CD EVR** and press **ENTER.**
o) Type **COPY CL120E. EVR B :** and press **ENTER.**
p) After completing installation of program, you are ready to use E.V.R adjustment program.

Note :

When completed the new disk should be a bootable disk which contains the following files :

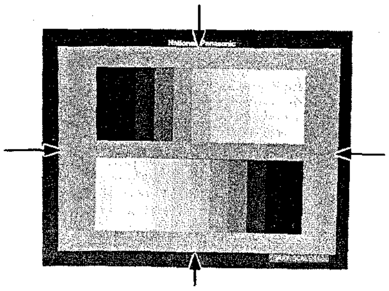
1.	COMMAND	COM
2.	ANSI	SYS
3.	CONFIG	SYS
4.	ADJS	EXE
5.	CL120E	SEQ
6.	CL120E	EVR

ADJUSTMENT PROCEDURE

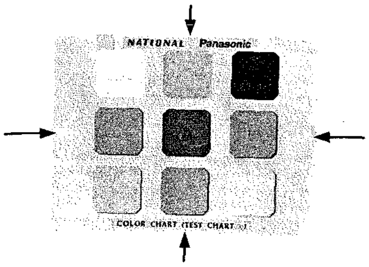
1. Test Equipment Required

The following test equipments are required for adjustment.

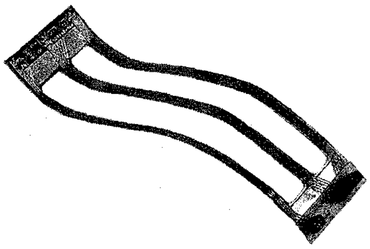
- Oscilloscope (50 MHz band width, dual trace, delayed with three probes)
- Vector scope
- Frequency counter for FM audio
- Waveform monitor
- Under scanned color video monitor
- Lens : WV-LA12 and F1.4 manual iris lens
- Lighting (140 footcandles (1400 lux) 3200°K)
- Lux meter
- Signal generator (Black burst or Composite video signal)
- Color temperature conversion filter (C12, C4 by KENKO)
- Personal computer (IBM-PS2 type)
- Standard straight RS-232C cable
- Logarithmic gray scale chart (Part No. : YWV2310RB99)



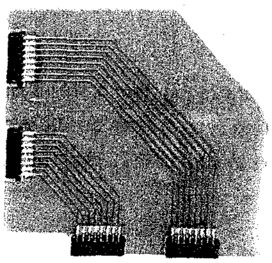
- Color chart (Part No. : YWV2310RB98)



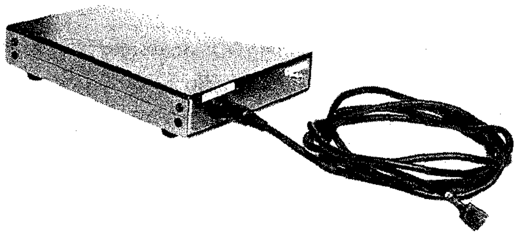
- Flexible extension board (Part No. YWVKZCL12P1A)



- Extension board (Part No. : YWVKZCL32P1A)

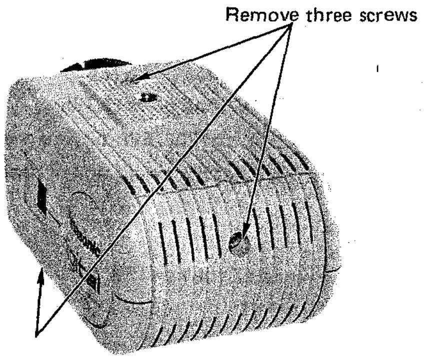


- E.V.R Adjustment kit (YWV0E0182AN)

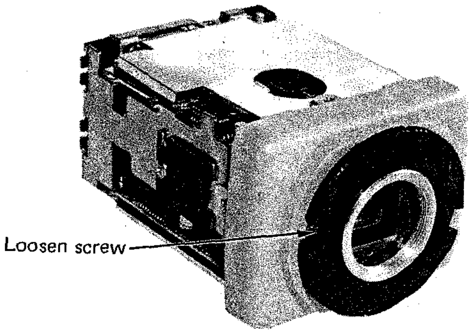


2. Disassembling Procedure for Adjustment

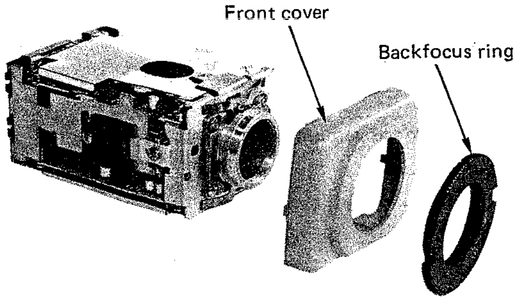
- Remove 4 screws fixing the camera covers and remove them.



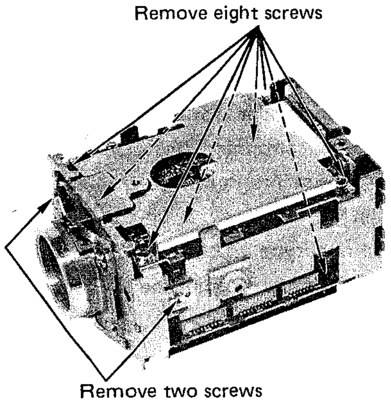
- Loosen the backfocus ring screw.



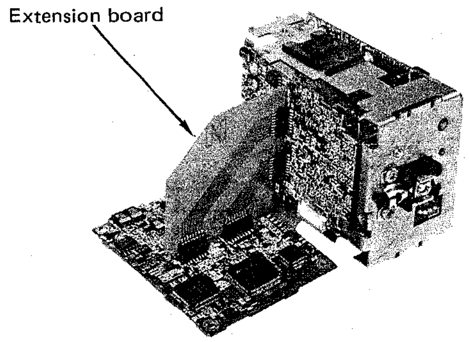
- Remove the backfocus ring and the front cover.


Front cover
Backfocus ring

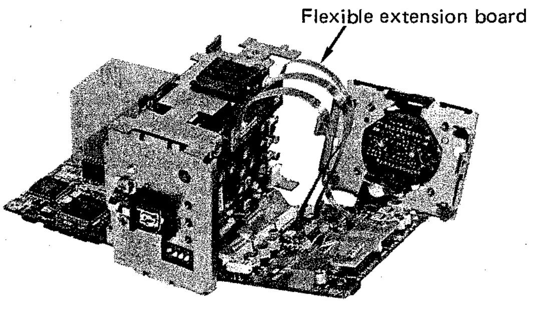
- Remove eight screws fixing the PCBs and two screws fixing the camera head.


Remove eight screws
Remove two screws

- Disconnect the Digital board from Sync board and insert the Extension board in between them.

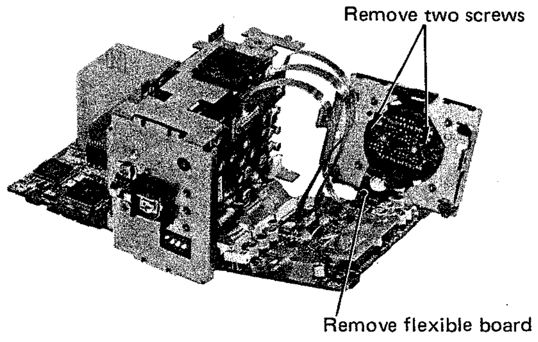

Extension board

- Disconnect the Drive board from VP board and insert the Flexible extension board in between them.

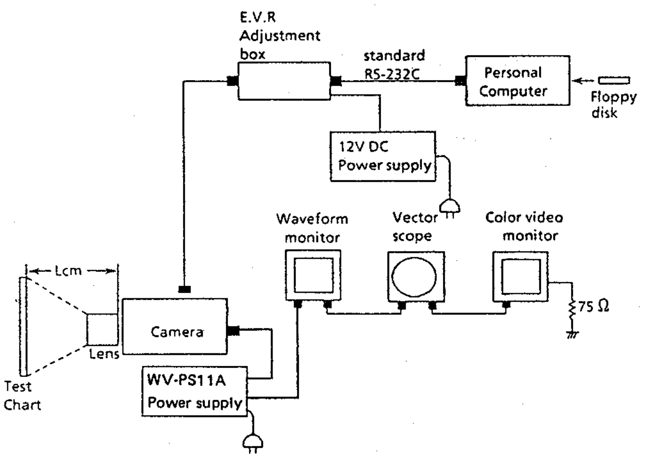

Flexible extension board

3. CCD Head A'ssy Replacement

- Remove 2 screws (+) and remove the flexible board.


Remove two screws
Remove flexible board

4. Connection and Setting up for Adjustment


E.V.R Adjustment box
standard RS-232C
Personal Computer
Floppy disk
12V DC Power supply
Waveform monitor
Vector scope
Color video monitor
75 Ω
Lcm
Lens
Camera
Test Chart
WV-PS11A Power supply

Connection

- Connect the VIDEO OUTPUT connector on the rear of camera control unit to color video monitor through waveform monitor and vectorscope using coaxial cable.
- Terminate color video monitor with 75 ohms.

Set up

- Set up the EVR adjustment box referring to the operation manual of it.

5. Adjustment Procedure

- Refer to page 21 for the Location of test points and adjusting control.

■ Adjustment Procedure-1

(1)-1 +9V Adjustment

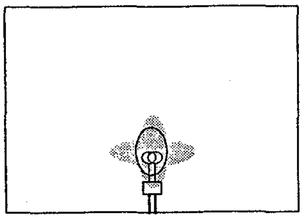
Test Point : TP1 VP board
Adjust : VR1 VP board

- Connect digital voltmeter to TP1.
- Adjust VR1 to obtain voltage 9.6 ± 0.05 VDC.

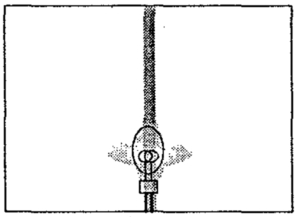
(1)-2 V.Sub Adjustment

Test Point : Monitor TV
Adjust : VR2 (V. Sub) Sensor board (CAMERA HEAD)

- Attach the F1.4 lens on the camera and open the iris fully.
- Aim the camera at the bright object such as 40-watts lamp.
- While observing the picture on the video monitor, adjust VR2 so that the blooming becomes minimum.



GOOD



NO GOOD

(1)-3 Drive VCO Adjustment (confirmation)

Test Point : TP1 (VCO) Drive board
Adjust : L12 (VCO) Drive board

- Connect digital voltmeter to TP1 (VCO) on the drive board.
- Confirm that voltage at TP1 is 2.3 ± 0.1V.
- If not, L12 (VCO) so that voltage becomes 2.3V ± 0.1V.

(1)-4 FM Audio Adjustment

Test point : TP3 VP board
Adjust : L8 VP board

- Connect the FM audio frequency counter to TP3 on the VP board.
- Adjust L8 so that the frequency becomes 11.2 MHz ± 5 KHz.

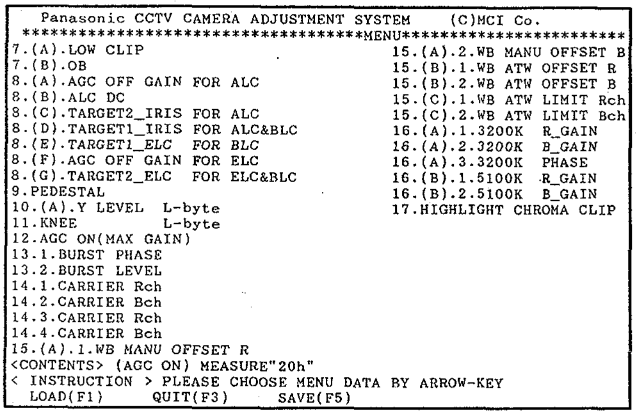
(1)-5 Audio Gain Adjustment

Test Point : Optional speaker
Adjust : VR2 VP board

- This adjustment should be necessary when the audio howling occurs.
- Adjust VR2 to cease the audio howling.
- The VR2 has been set to the maximum position at the factory.

■ Adjustment Procedure-2 (E.V.R Adjustment)

- Connect E.V.R Adjustment box to CN5 on the digital board using extension cable supplied.
- Connect E.V.R Adjustment box to IBM-PC (Personal Computer) using standard RS-232C cable.
- Insert new disk containing Dos operating system and E.V.R Adjustment Program into IBM-PC and turns on power of IBM-PC
- At the prompt, type **ADJS CL120E** and press **ENTER**, following initial menu for adjustment will be displayed.



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM    (C)MCI Co.
 ************************************MENU************************
7.(A).LOW CLIP                                   15.(A).2.WB MANU OFFSET B
7.(B).OB                                         15.(B).1.WB ATW OFFSET R
8.(A).AGC OFF GAIN FOR ALC                       15.(B).2.WB ATW OFFSET B
8.(B).ALC DC                                     15.(C).1.WB ATW LIMIT Rch
8.(C).TARGET2_IRIS FOR ALC                       15.(C).2.WB ATW LIMIT Bch
8.(D).TARGET1_IRIS FOR ALC&BLC                   16.(A).1.3200K  R_GAIN
8.(E).TARGET1_ELC  FOR BLC                       16.(A).2.3200K  B_GAIN
8.(F).AGC OFF GAIN FOR ELC                       16.(A).3.3200K  PHASE
8.(G).TARGET2_ELC  FOR ELC&BLC                   16.(B).1.5100K  R_GAIN
9.PEDESTAL                                       16.(B).2.5100K  B_GAIN
10.(A).Y LEVEL  L-byte                           17.HIGHLIGHT CHROMA CLIP
11.KNEE         L-byte
12.AGC ON(MAX GAIN)
13.1.BURST PHASE
13.2.BURST LEVEL
14.1.CARRIER Rch
14.2.CARRIER Bch
14.3.CARRIER Rch
14.4.CARRIER Bch
15.(A).1.WB MANU OFFSET R
<CONTENTS> (AGC ON) MEASURE"20h"
< INSTRUCTION > PLEASE CHOOSE MENU DATA BY ARROW-KEY
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

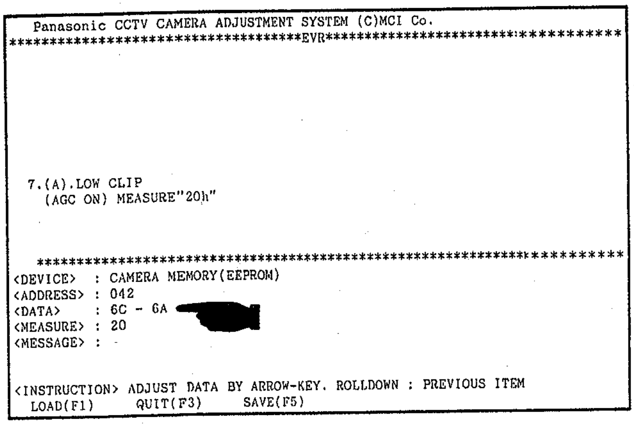
- Press SAVE (F5). Then computer will ask you for the file name.
- Give appropriate file name to the computer. But do not use CL120E.EVR for your file name. This Saving procedure is recommended to keep the current status of the camera.
- Press **LOAD (F1)** and type CL120E . EVR (if using **WV-CL120E**), and press **ENTER** for presetting adjustment of the camera.
- After finishing, the message **ERROR 14 SCK NG!** may be displayed, but this is normal (Not real NG).
- Press ENTER for starting adjustment.

NOTE :

- **EEPROM** (IC 7) mentioned in this adjustment procedure is located on digital board.
- **RAM** (IC10) mentioned in this adjustment procedure is located on digital board.
- Press SAVE (F5). The computer will ask you the file name.
- Some numbers of the following Adjustment Procedure-2 are missing due to matching the adjustment items with the EVR adjustment items.

(7)-A Low clip adjustment

Test Point : RAM (D2)
Adjust : EEPROM (42)

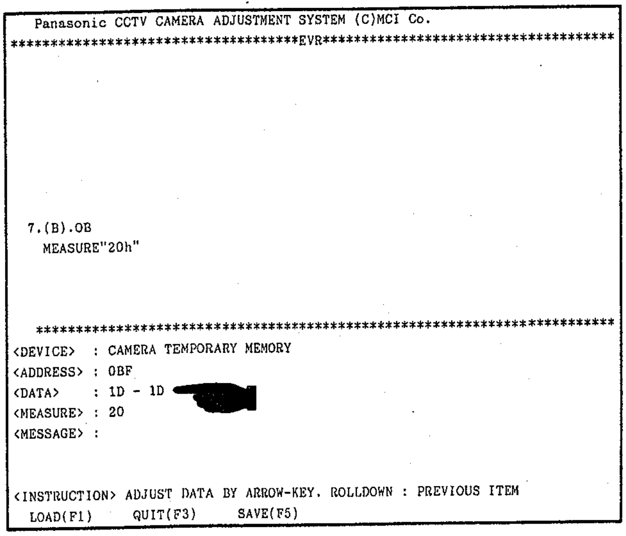


```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR****************************************




 7.(A).LOW CLIP
   (AGC ON) MEASURE"20h"


   ****************************************************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS> : 042
<DATA>     : 6C - 6A
<MEASURE> : 20
<MESSAGE> : -

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Confirm that lens iris is closed.
- Adjust data by **ARROW** keys so that the measured level becomes 20.
- Press **ENTER** key.

(7)-B OB adjustment

Test Point : RAM (D2)
Adjust : EEPROM (BF)

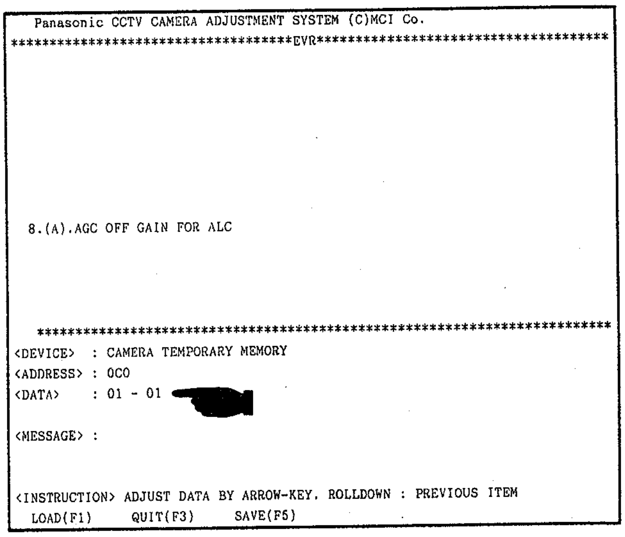


```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR****************************************




 7.(B).OB
   MEASURE"20h"


   ****************************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0BF
<DATA>     : 1D - 1D
<MEASURE> : 20
<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Confirm that lens iris closes.
- Adjust data by **ARROW** keys so that the measured level becomes 20.
- Repeat adjustment (7)-A and (7)-B until both measured levels become 20.
- Press **ENTER** key.

(8)-A AGC OFF gain adjustment

Test Point : Pin 3 (AGC OUT) of CN5
Digital board
Adjust : RAM (C0) IC10



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR****************************************




 8.(A).AGC OFF GAIN FOR ALC


   ****************************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0C0
<DATA>     : 01 - 01

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Change the ALC lens to F1.4 manual iris lens.
- Connect oscilloscope to pin 1 (CDS OUT) of CN5 on digital board.
- Aim the camera at logarithmic gray scale chart.
- Adjust lens iris so that CDS output signal at pin 1 of CN5 becomes 460 mV as shown in Fig. 5-1.

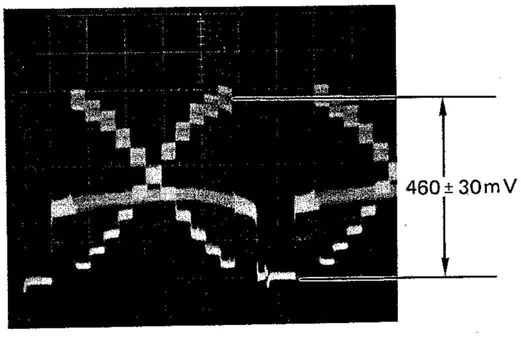


Fig. 5-1

- Change oscilloscope from pin 1 of CN5 to pin 3 of CN5.
- Adjust data by **ARROW** keys so that signal level becomes 600 ± 30 mV as shown in Fig. 5-2.

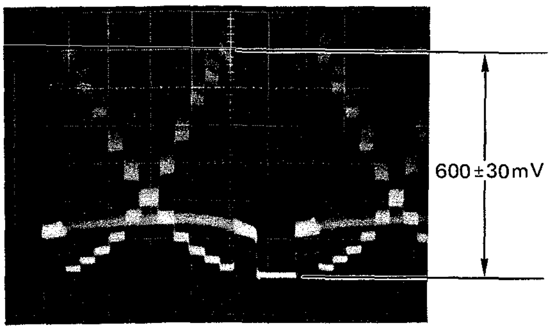


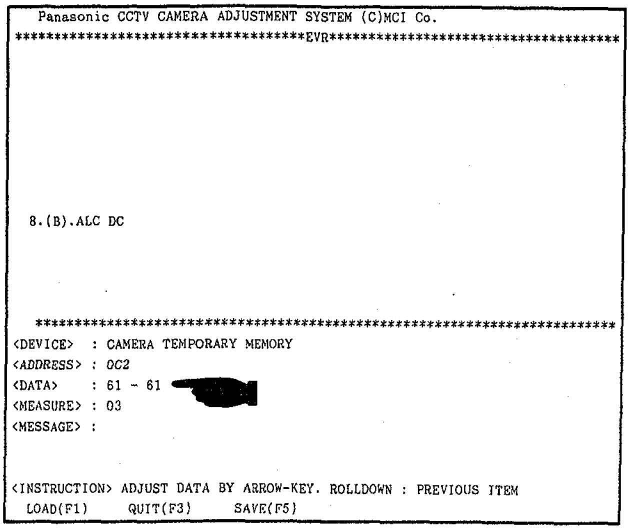
Fig. 5-2

- Press **ENTER** key.

(8)-B ALC DC adjustment

Test Point : RAM (D5)
Adjust : RAM (C2)

Note : Installed lens should be DC servo type for this adjustment.

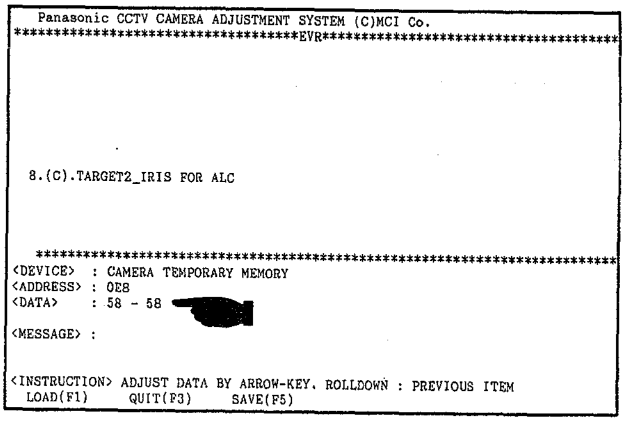


```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR************************************

 8.(B).ALC DC

 **************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0C2
<DATA>    : 61 - 61
<MEASURE> : 03
<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Change the F1.4 manual iris lens to the ALC lens.
- Aim the camera at logarithmic gray scale chart.
- Adjust data by **ARROW** keys so that the measured level becomes between 03 and 04.
- Press **ENTER** key.

(8)-C BLC preset OFF (Target 2 iris) adjustment

Test Point : Pin 1 (CDS OUT) of CN5
Digital board
Adjust : RAM (E8) IC10



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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 8.(C).TARGET2_IRIS FOR ALC

 ***************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0E8
<DATA>    : 58 - 58

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 1 (CDS OUT) of CN5.
- Adjust date by **ARROW** Key so that the signal level becomes 460 ±30 mV as shown Fig. 5-3.

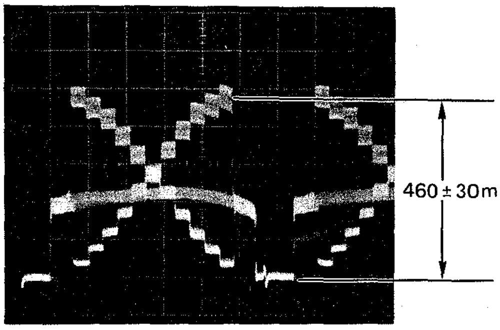
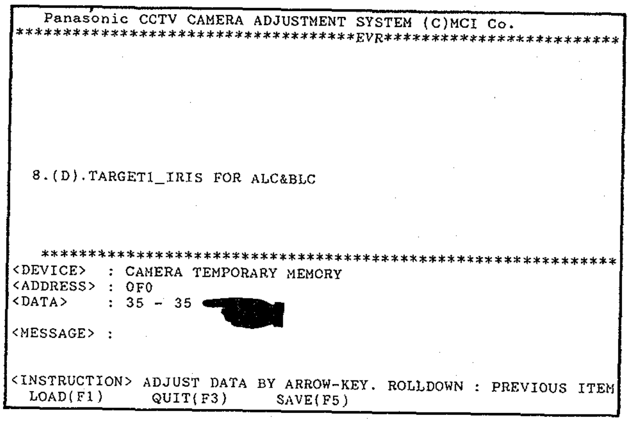


Fig.5-3

- Press **ENTER** key.

(8)-D BLC preset ON (Target 1 iris) adjustment

Test Point : Pin 1 (CDS OUT) of CN5
Digital board
Adjust : RAM (F0) IC10



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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 8.(D).TARGET1_IRIS FOR ALC&BLC

 ***************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0F0
<DATA>    : 35 - 35

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 1 (CDS OUT) of CN5.
- Adjust date by **ARROW** Key so that the signal level becomes 460 ± 30 mV as shown Fig. 5-4.

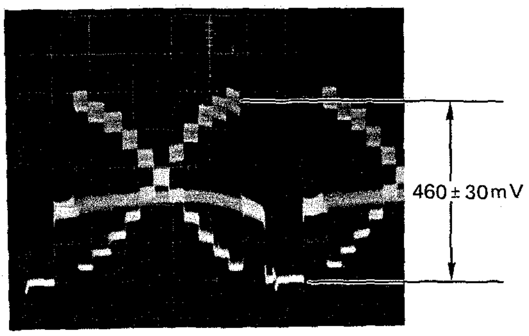
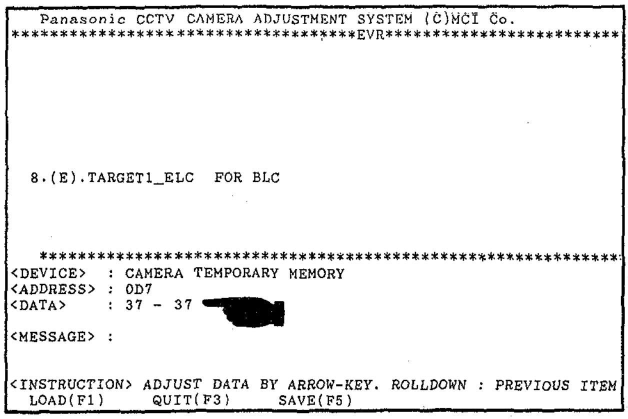


Fig. 5-4

- Press **ENTER** key.

(8)-E BLC Preset ON (Target 1 ELC) adjustment

Test Point : Pin 3 (AGC OUT) of CN5
Digital board
Adjust : RAM (D7)



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
**************************************EVR**************************



 8.(E).TARGET1_ELC  FOR BLC


  *****************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0D7
<DATA>    : 37 - 37

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 3 of CN5.
- Adjust data by **ARROW** keys so that the signal level becomes 600 ± 30 mV as shown in Fig. 5-5.

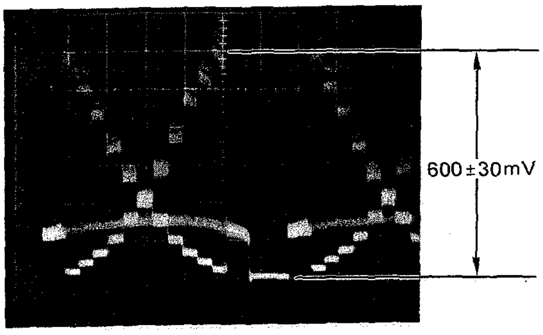
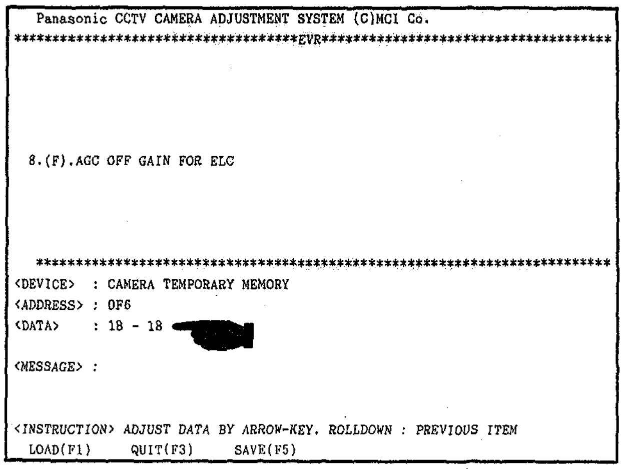


Fig. 5-5

- Press **ENTER** key.

(8)-F AGC OFF gain (ELC) adjustment

Test Point : Pin 1 (CDS OUT) of CN5
Digital board
Adjust : RAM (F6) IC10



```
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 8.(F).AGC OFF GAIN FOR ELC


  *****************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0F6
<DATA>    : 18 - 18

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 1 of CN5.
- Adjust data by **ARROW** keys so that the signal level becomes 460 ± 30 mV as shown in Fig. 5-6.

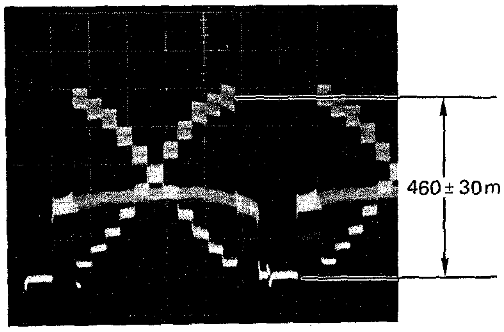
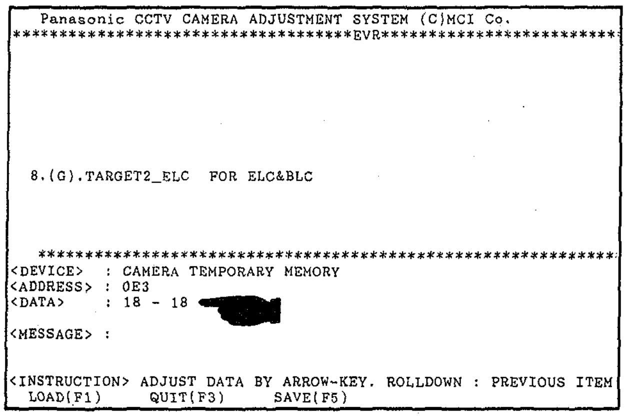


Fig. 5-6

- Press **ENTER** key.

(8)-G BLC preset OFF (Target 2 ELC) adjustment

Test Point : Pin 1 (CDS OUT) of CN5
Digital board
Adjust : RAM (E3)



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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 8.(G).TARGET2_ELC  FOR ELC&BLC


  *****************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0E3
<DATA>    : 18 - 18

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 1 of CN5.
- Adjust data by **ARROW** keys so that the signal level becomes 460 ± 30 mV as shown in Fig. 5-7.

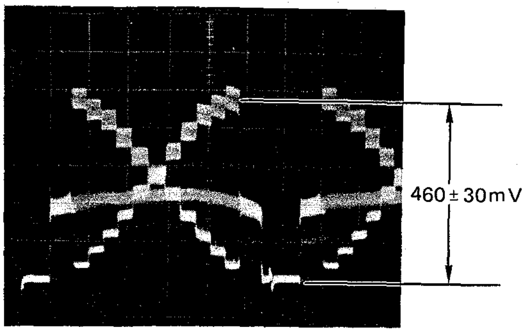
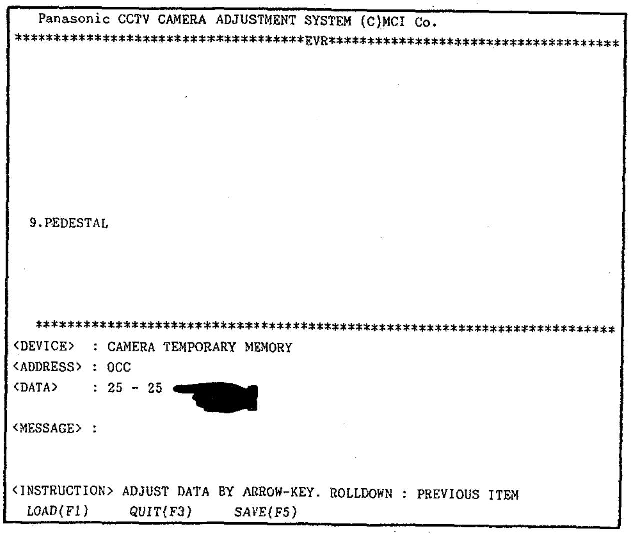


Fig. 5-7

- Press **ENTER** key.

(9) Pedestal adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (CC)



```
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9.PEDESTAL


 ***************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0CC
<DATA>    : 25 - 25

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Cap on the lens.
- Connect waveform monitor or terminate oscilloscope to VIDEO OUTPUT connector.
- Adjust data by **ARROW** keys so that the signal level becomes 50 ± 5 mV as shown in Fig. 5-8.

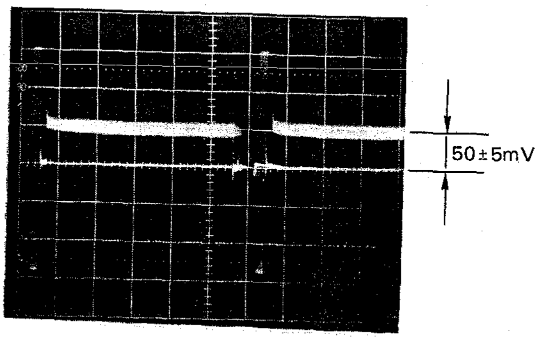
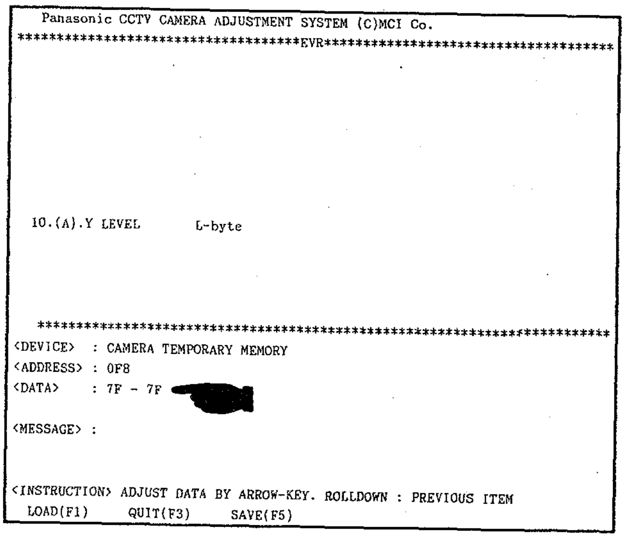


Fig. 5-8

- Press **ENTER** key.

(10)-A Y. level adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (F8)



```
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 10.(A).Y LEVEL         L-byte


 ***************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0F8
<DATA>    : 7F - 7F

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect waveform monitor or terminate oscilloscope to VIDEO OUTPUT connector.
- Adjust data by **ARROW** keys so that the signal level becomes 700 ± 50 mV (98 ± 7 IRE) as shown in Fig. 5-9.

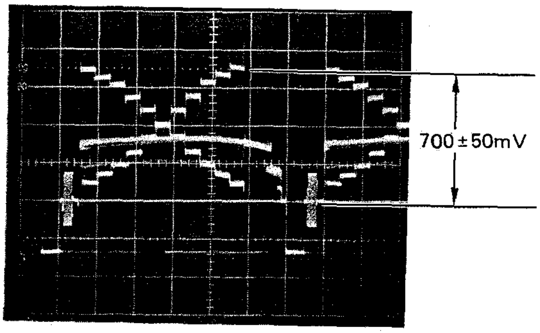
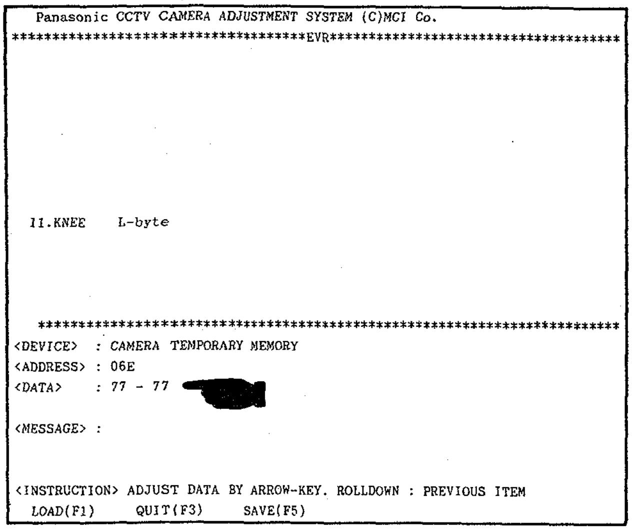


Fig. 5-9

- Press **ENTER** key.

(11) Knee level adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (6E)



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
**************************************EVR**************************************




 11.KNEE    L-byte



 ******************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 06E
<DATA>    : 77 - 77

<MESSAGE> :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Change the ALC lens to F1.4 manual iris lens.
- Aim the camera at logarithmic gray scale chart.
- Turn the lens iris fully open.
- Connect waveform monitor or terminate oscilloscope to VIDEO OUTPUT connector

- Adjust data by **ARROW** keys so that the signal level becomes 840 $^{+35mV}_{-0}$ (120 +5, –0 IRE) as shown in Fig. 5-10.

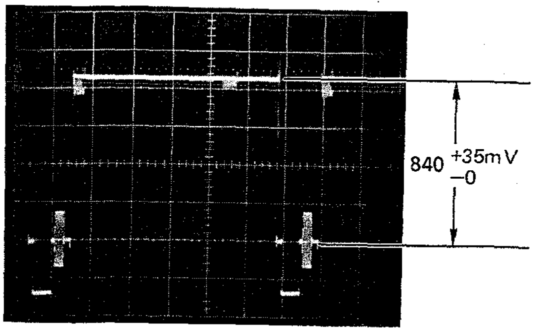
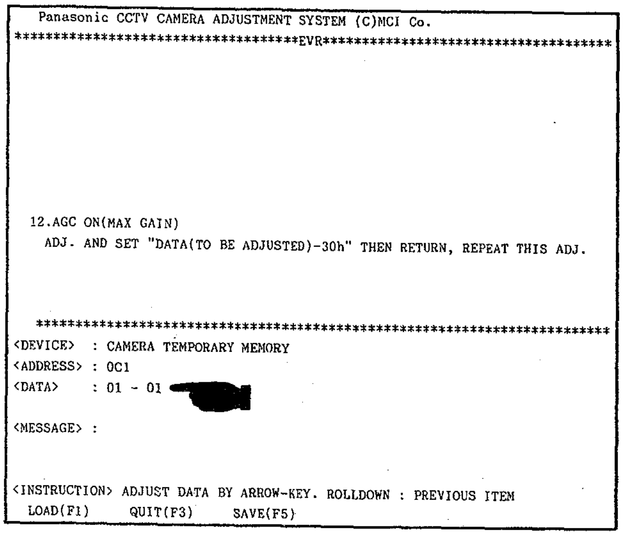


Fig. 5-10

(12) AGC ON (Max gain) adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (187)



```
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 12.AGC ON(MAX GAIN)
   ADJ. AND SET "DATA(TO BE ADJUSTED)-30h" THEN RETURN, REPEAT THIS ADJ.



 ******************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0C1
<DATA>    : 01 - 01

<MESSAGE> :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Change lighting from 1400 lux to 3 lux
- Turn the lens iris fully open.
- Aim the camera at logarithmic gray scale chart.
- Adjust data by **ARROW** keys so that the signal level becomes 280 ± 35 mV (39.2 ± 4.9 IRE).

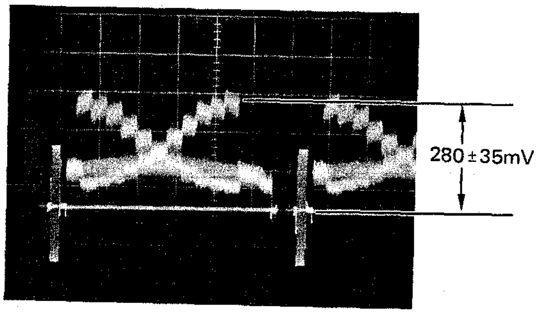
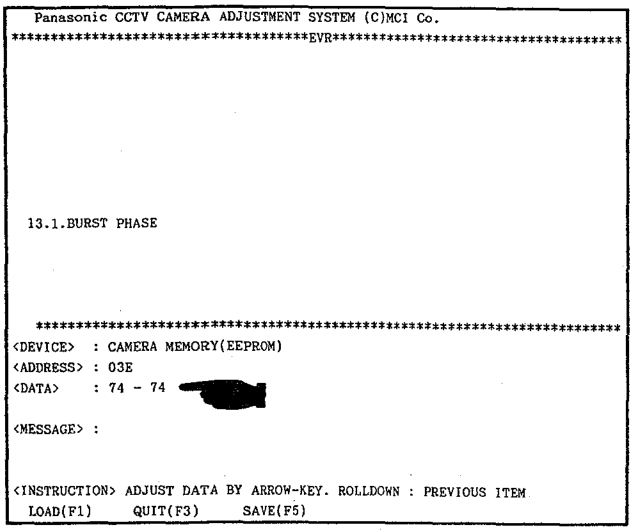


Fig. 5-11

- Return lighting from 3 lux to 1400 lux.
- Press ENTER key.

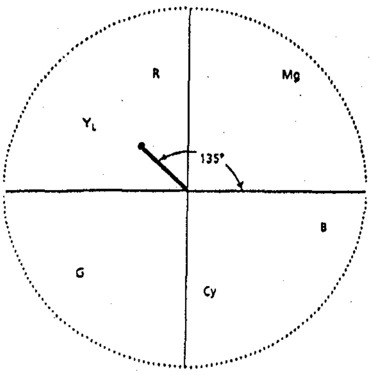
(13)-1 Burst phase adjustment

Test Point : VIDEO OUTPUT connector
Adjust : EEPROM (3E)



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR************************************




 13.1.BURST PHASE



  **************************************************************************
<DEVICE>  : CAMERA MEMORY(EEPROM)
<ADDRESS> : 03E
<DATA>    : 74 - 74

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

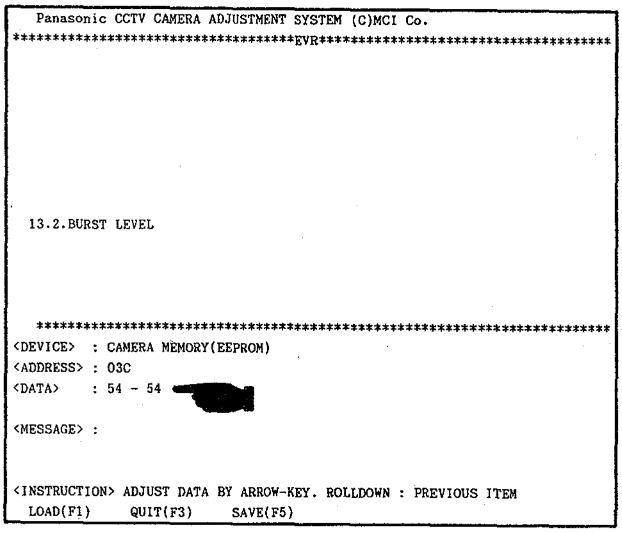
- Adjust data by **ARROW** keys so that the burst phase becomes 135°.



- Press ENTER key.

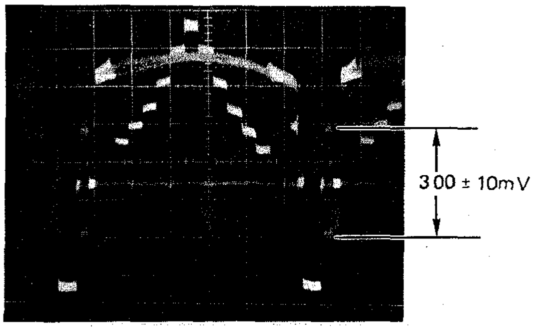
(13)-2 Burst level adjustment

Test Point : VIDEO OUTPUT connector
Adjust : EEPROM (3C)



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR************************************




 13.2.BURST LEVEL


  **************************************************************************
<DEVICE>  : CAMERA MEMORY(EEPROM)
<ADDRESS> : 03C
<DATA>    : 54 - 54

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Adjust data by **ARROW** keys so that the burst level becomes 300 ± 10 mV (42 ± 1.4 IRE) as shown in Fig. 5-12.



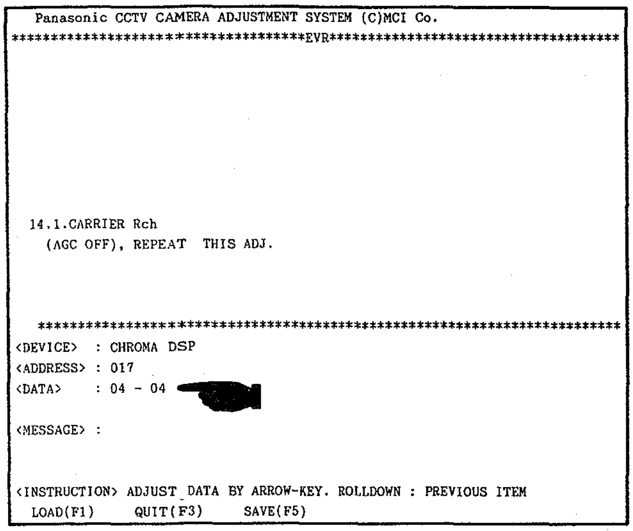
- Press ENTER key.

(14) R. B carrier balance adjustment

Test Point : VIDEO OUTPUT connector
Adjust : C. DSP (17)
C. DSP (18)

- Set the gain of vectorscope to maximum.

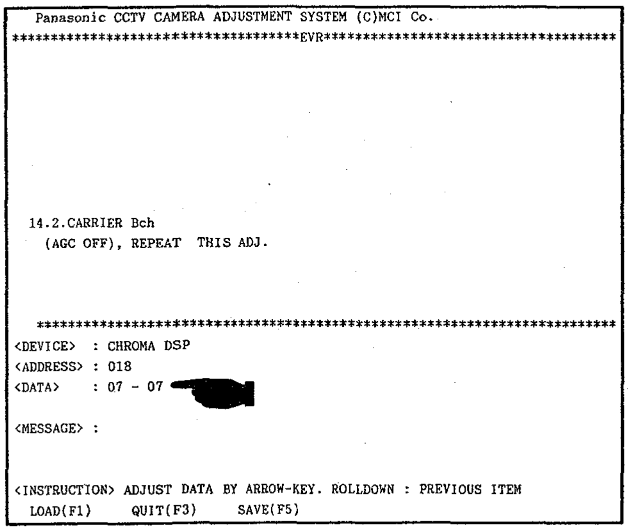
(14)-1 R. Carrier balance adjustment (AGC-OFF)



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************




14.1.CARRIER Rch
  (AGC OFF), REPEAT  THIS ADJ.


*****************************************************************************
<DEVICE>  : CHROMA DSP
<ADDRESS> : 017
<DATA>    : 04 - 04

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.

(14)-2 B. Carrier balance adjustment (AGC-OFF)



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************




14.2.CARRIER Bch
  (AGC OFF), REPEAT  THIS ADJ.


*****************************************************************************
<DEVICE>  : CHROMA DSP
<ADDRESS> : 018
<DATA>    : 07 - 07

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key to return to (14)-1, and repeat above procedure until vector positions at the center of vectorscope as shown in Fig. 5-13.

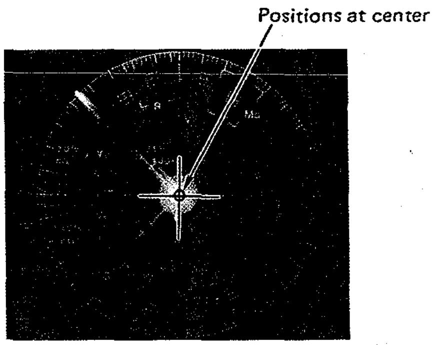
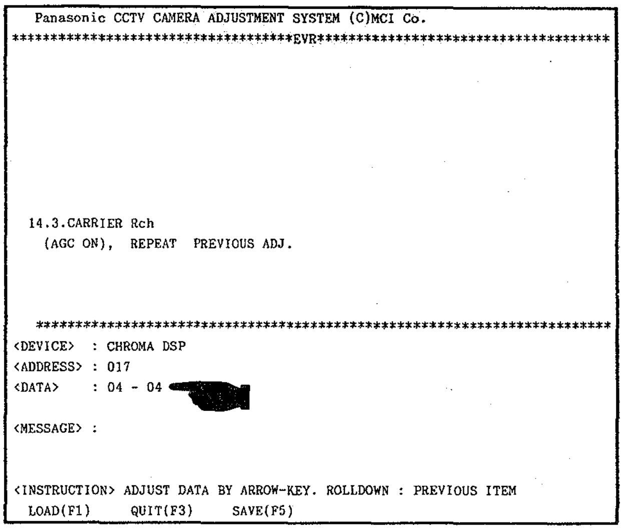


Fig. 5-13

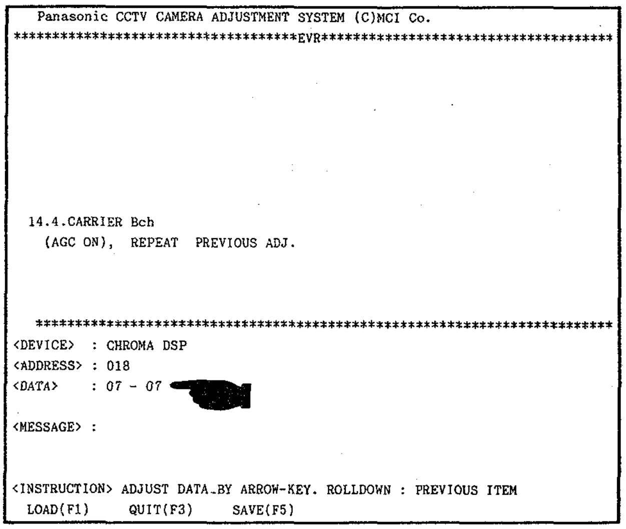
(14)-3 R. Carrier balance adjustment (AGC-ON)



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************




14.3.CARRIER Rch
  (AGC ON),  REPEAT  PREVIOUS ADJ.


*****************************************************************************
<DEVICE>  : CHROMA DSP
<ADDRESS> : 017
<DATA>    : 04 - 04

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

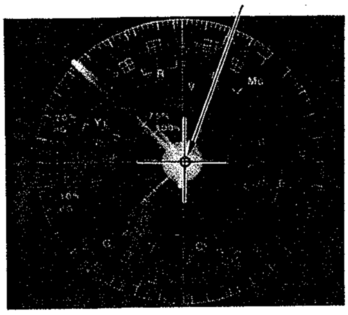
- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope
- Press **ENTER** key.

(14)-4 B Carrier balance adjustment (AGC-ON)



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************




14.4.CARRIER Bch
  (AGC ON),  REPEAT  PREVIOUS ADJ.


*****************************************************************************
<DEVICE>  : CHROMA DSP
<ADDRESS> : 018
<DATA>    : 07 - 07

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key to return to (14)-3, and repeat above procedure until vector positions at the center of vectorscope as shown in Fig. 5-14.



Positions at center

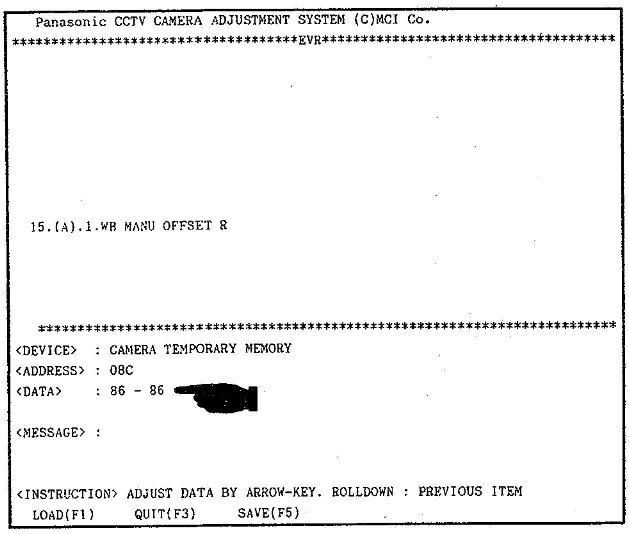
Fig. 5-14

(15)-A White balance manual offset adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (8C)
RAM (8D)

- Aim the camera at white chart.
- Set the gain of vectorscope to maximum.

(15)-A-1 R. White balance manual offset adjustment



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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15.(A).1.WB MANU OFFSET R

*****************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 08C
<DATA>    : 86 - 86

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```
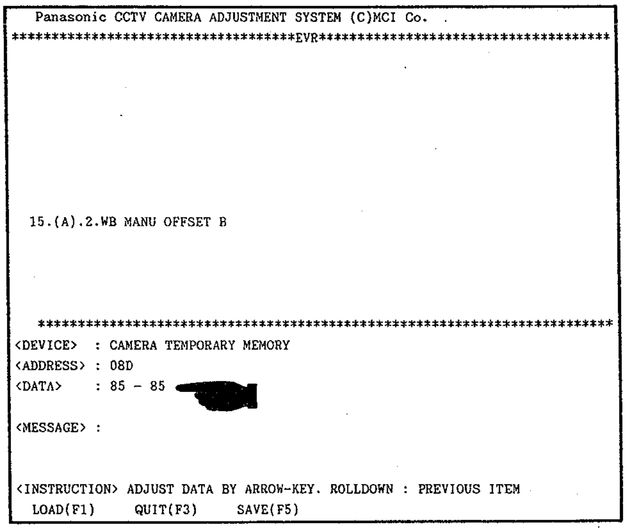
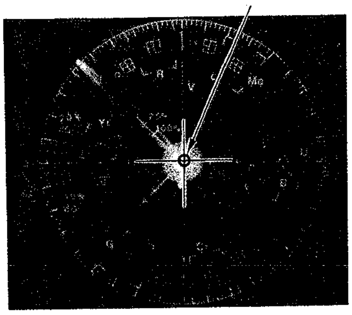

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.

(15)-A-2 B. White balance manual offset adjustment



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************

15.(A).2.WB MANU OFFSET B

*****************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 08D
<DATA>    : 85 - 85

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key to return to (15)-A-1, and repeat above procedure until vector positions at the center of vectorscope as shown in Fig. 5-15.



Positions at center

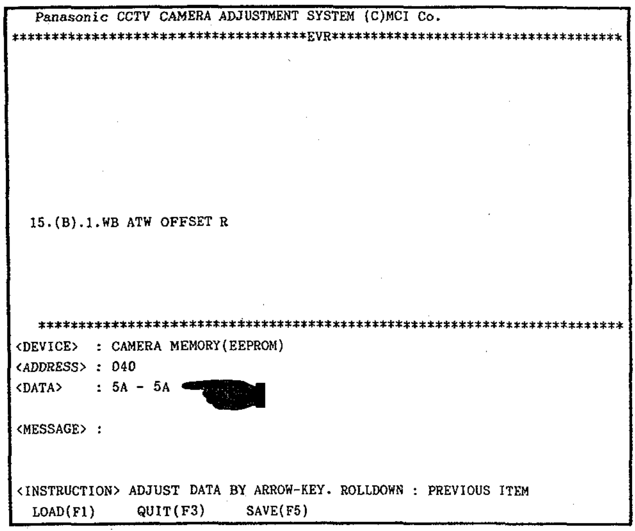
Fig. 5-15

(15)-B ATW offset adjustment

Test Point : VIDEO OUTPUT connector
Adjust : EEPROM (40) IC7
EEPROM (41) IC7

- Aim the camera at white chart.
- Set the gain of vectorscope to maximum.

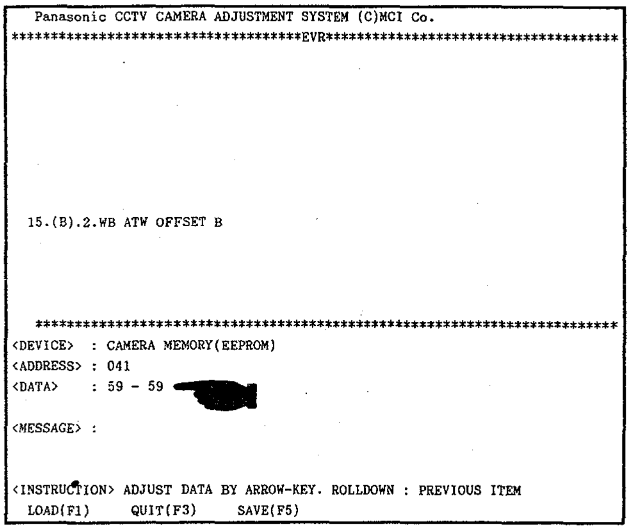
(15)-B-1 R. ATW offset adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************





 15.(B).1.WB ATW OFFSET R



  ***************************************************************************
<DEVICE>  : CAMERA MEMORY(EEPROM)
<ADDRESS> : 040
<DATA>    : 5A - 5A

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.

(15)-B-2 B. ATW offset adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************





 15.(B).2.WB ATW OFFSET B



  ***************************************************************************
<DEVICE>  : CAMERA MEMORY(EEPROM)
<ADDRESS> : 041
<DATA>    : 59 - 59

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key on a to return to (15)-B-1, and repeat above procedure until vector positions at the center of vectorscope as shown in Fig. 5-16.

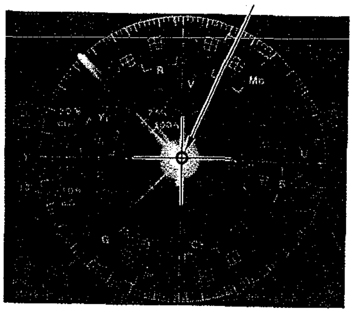


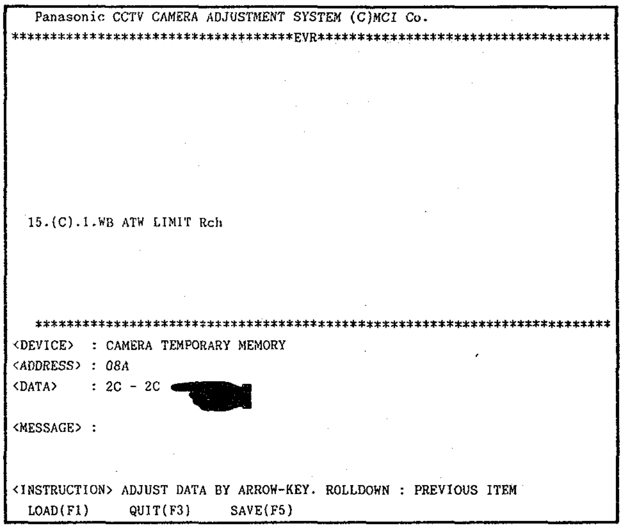
Fig. 5-16

(15)-C ATW limit adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (8A)
RAM (8B)

- Aim the camera at white chart.
- Set CC filter (C12 + C4) on the lens to convert the light from 3200°K to 6500°K.

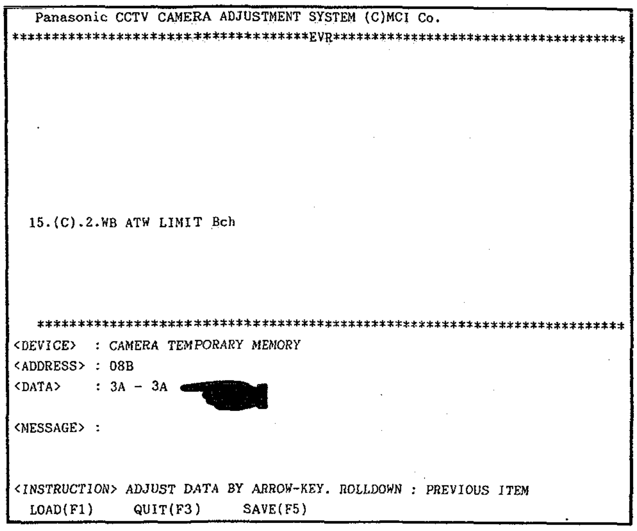
(15)-C-1 R. ATW offset adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************





 15.(C).1.WB ATW LIMIT Rch



  ***************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 08A
<DATA>    : 2C - 2C

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

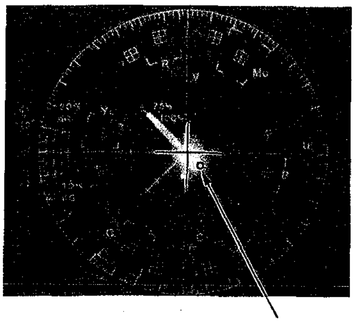
- Adjust data by **ARROW** keys so that the vector positions at the center of vectorscope
- Press **ENTER** key.

(15)-C-2 B. ATW offset adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************

 15.(C).2.WB ATW LIMIT Bch

 ****************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 08B
<DATA>    : 3A - 3A

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that the vector shifts 10% (Burst = 100%) to Cyan side on vectorscope.
- Press **ENTER** key.
- If the vector does not shift 10% (Burst = 100%) to cyan side on vectorscope, press **PG DN** key to return to (15)-C-1, and repeat above procedure until vector shifts 10% to cyan side on vectorscope as shown in Fig. 5-17.



Shifted approx. 10%

Fig. 5-17

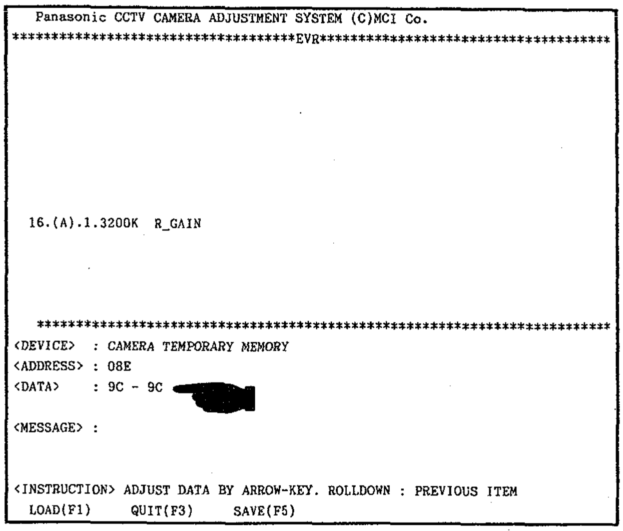
- Remove CC filter from the lens.

(16)-A White balance adjustment (3200°K)

Test Point : VIDEO OUTPUT connector
Adjust : RAM (8E)
RAM (8F)
RAM (186)

- Aim the camera at color chip chart.
- Set the gain of vectorscope to 75% position.

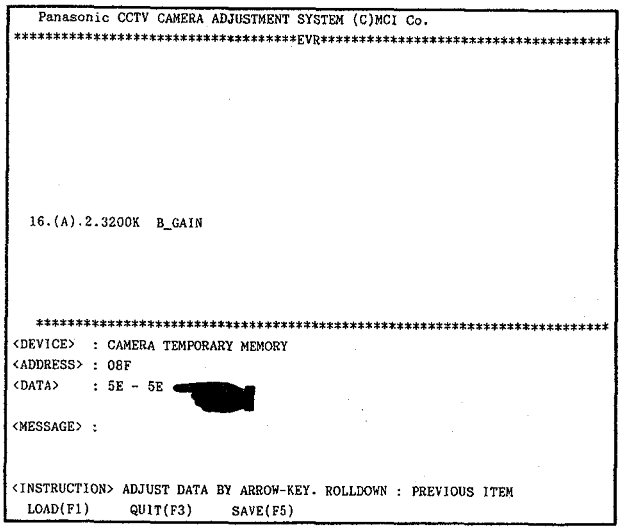
(16)-A-1 R. Gain adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************

 16.(A).1.3200K  R_GAIN

 ****************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 08E
<DATA>    : 9C - 9C

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that the red gain becomes 200 ± 5% (Burst = 100 %).
- Press **ENTER** key.

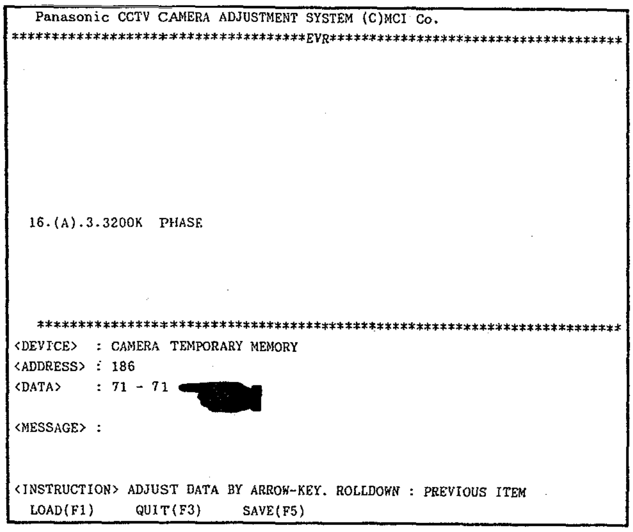
(16)-A-2 B. Gain adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************

 16.(A).2.3200K  B_GAIN

 ****************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 08F
<DATA>    : 5E - 5E

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that the yellow gain becomes 120 ± 5% (Burst = 100%).
- Press **ENTER** key.

(16)-A-3 Chroma phase adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR************************************



 16.(A).3.3200K  PHASE



 ***************************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 186
<DATA>     : 71 - 71

<MESSAGE> :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that two red vectors coincided.
- Press **ENTER** key.
- If the chrominance phase and gain should not be adjusted to proper position, press **PG DN** key to return to (16)-A-1, and repeat above procedure until they are adjusted to proper position as shown in table -1.

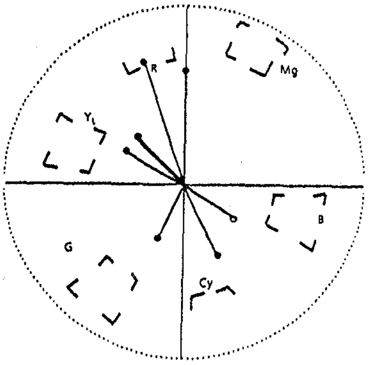


Fig. 5-23

	Red	Yellow
Phase	104 ± 2°	157 ± 5°
Gain	200 ± 5%	120 ± 5%

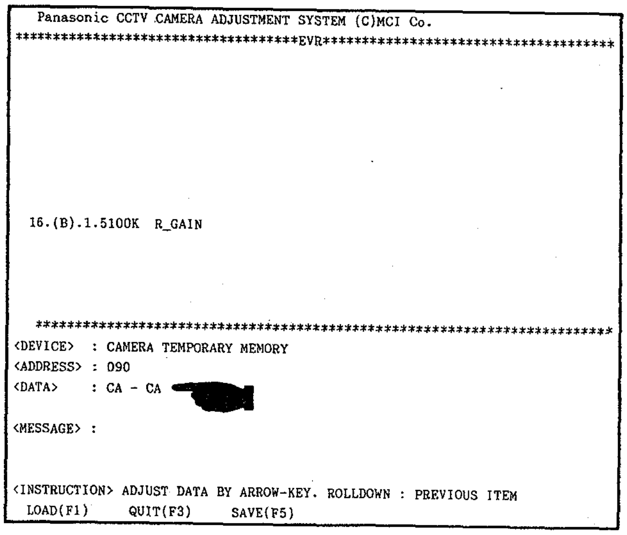
Table-1

(16)-B White balance adjustment (5100°K)

Test Point : VIDEO OUTPUT connector
Adjust : RAM (90)
RAM (91)

- Aim the camera at color chip chart.
- Set CC filter (C12) on the lens to convert the light from 3200°K to 5100°K.

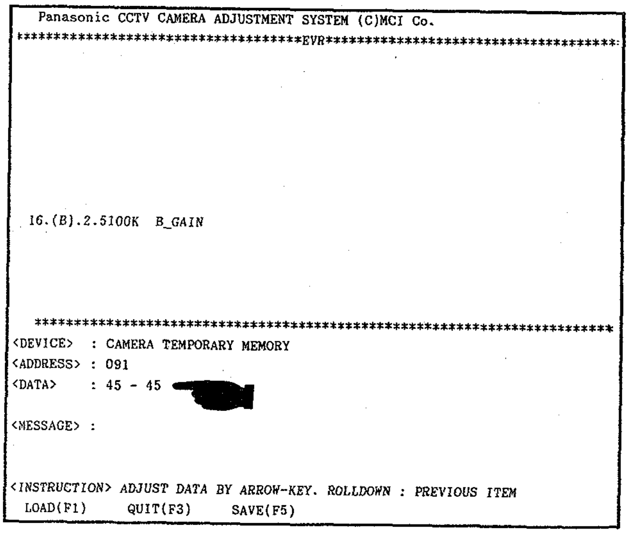
(16)-B-1 R. Gain adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR************************************



 16.(B).1.5100K  R_GAIN



 ***************************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 090
<DATA>     : CA - CA

<MESSAGE> :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that red gain becomes 200 ± 5% (Burst = 100%) .
- Press **ENTER** key.

(16)-B-2 B. Gain adjustment



```
 Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************************EVR************************************



 16.(B).2.5100K  B_GAIN



 ***************************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 091
<DATA>     : 45 - 45

<MESSAGE> :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by **ARROW** keys so that yellow gain becomes 90 ± 5%(Burst = 100%).
- Press **ENTER** key.
- If the chrominance gain and phase should not be adjusted to proper position, press **PG DN** key to return to (16)-B-1, and repeat above procedure until they are adjusted to proper position as shown in table 2.

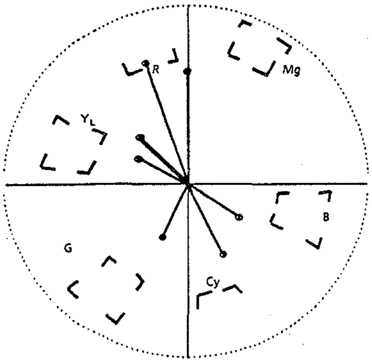


Fig-5-24

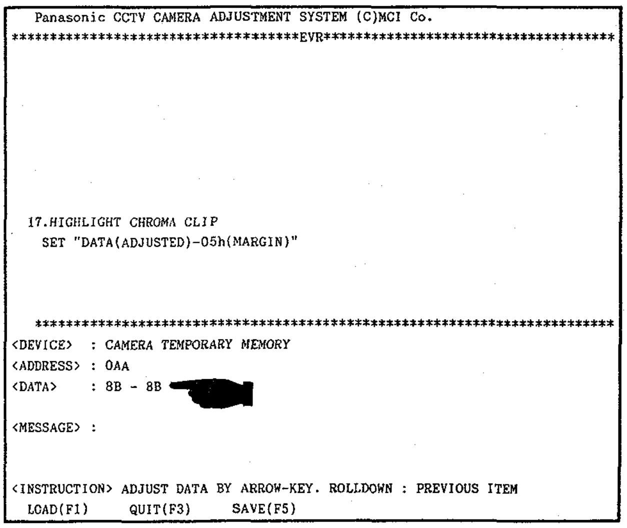
	Red	Yellow
Phase	104 ± 2°	157 ± 5°
Gain	200 ± 5%	90 ± 5%

Table-2

Note : Remove CC filter (C12) from the lens.

(17) Highlight chroma clip

Test Point : VIDEO OUTPUT connector
Adjust : RAM (AA)



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
*************************************EVR*************************************




 17.HIGHLIGHT CHROMA CLIP
   SET "DATA(ADJUSTED)-05h(MARGIN)"


  ****************************************************************************
<DEVICE>  : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0AA
<DATA>    : 8B - 8B

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Change the ALC lens to F1.4 manual iris lens.
- Aim the camera at white chart.
- Turn the lens iris to fully open.
- Adjust data by **ARROW** keys so that the chrominance level becomes minimum, and note this data as (a).
- Re-adjust data by **ARROW** keys so that the data becomes (b). (a)-05h = (b)

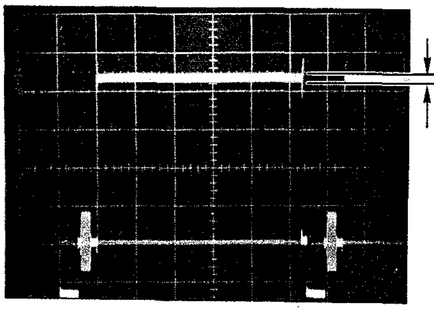


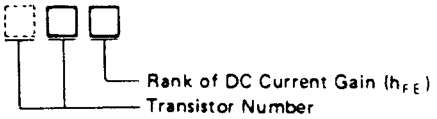
Fig-5-25

- Press **ENTER** key.
- After finishing adjustment, press QUIT (F3).
- Press **N** and **ENTER** to finish.
- Disconnect cable from CN5 on the digital board.

CHIP COMPONENTS

1. Chip Tranaiator

The transistor number is indicated on the top surface of the chip transistor using two alphabet letters or one numerical and two alphabet letters.


Rank of DC Current Gain (hFE)
Transistor Number

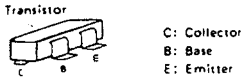
Transistor Number

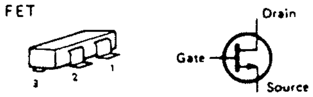
Letter	Transistor No.	Letter	Transistor No.
A	2SB709	X	2SD602A
B	2SB709A	Y	2SD601
C	2SB710	Z	2SD601A
D	2SB710A	1Z	2SD1030
E	2SA1022	1N	2SK199
F	2SA1034	1O	2SK198
H	2SA1035	1A	2SB799
I	2SB792	1B	2SB814
K	2SC2778	1C	2SB902
P	2SD814	1F	2SK321
Q	2SD813	1L	2SK247
R	2SC2480	1K	2SK316
S	2SC2405	1M	2SJ84
T	2SC2406	1T	2SC3077
U	2SC2404	1X	2SC2845
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116

Example

WQ ⟶ 2SD602 – Q
YQ ⟶ 2SD601 – Q
1BS ⟶ 2SB814 – S

Appearance and Symbols

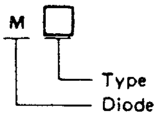

Transistor
C
B
E
C: Collector
B: Base
E: Emitter


FET
3
2
1
Drain
Gate
Source

	1	2	3
Except 2SK199	Drain	Source	Gate
2SK199	Gate	Drain	Source

2. Chip Diode

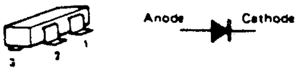
The diode number is indicated on the top surface of the chip diode using Two alphabet letters.


M
Type
Diode

Diode Number

Letter	Diode No.	Letter	Diode No.
MA	MA151A	MI	MA152K
MB	MA152A	MK	MA28W-B
MC	MA153	ML	MA28T-A
MD	MA28-A	MN	MA151WA
ME	MA28-B	MO	MA152WA
MF	MA28W-A	MT	MA151WK
MH	MA151K	MU	MA152WK

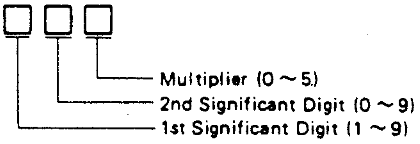
Appearance and Symbols


3
2
1
Anode
Cathode

	1	2	3
MA28/28W/28T	–	Anode	Cathode
MA151K/152K	–	Anode	Cathode
MA151A/152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common

3. Chip Resistor

The resistor value is indicated on the bottom surface of the chip resistor using three digit numbers.


Multiplier (0 ~ 5)
2nd Significant Digit (0 ~ 9)
1st Significant Digit (1 ~ 9)

EXAMPLE:

330 ⟶ $33 \times 10^0 = 33$ ohms
561 ⟶ $56 \times 10^1 = 560$ ohms
123 ⟶ $12 \times 10^3 = 12$ kohms

Note: Zero ohm resistor (jumper chip) is colored red or green.

4. Chip Capacitor

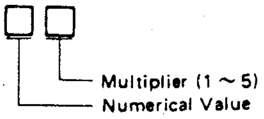
The capacitive value of replacement chip capacitors is indicated on the bottom surface. Original parts do not have value indication.

If the capacitive value is less than 100 pF, the value will be indicated by one or two digit number expressing the capacity directly in pF.

EXAMPLE:

0.5	⟶	0.5 pF	2.5	⟶	2.5 pF
75	⟶	0.75 pF	33	⟶	33 pF
1	⟶	1 pF	82	⟶	82 pF

If the capacitive value is 100 pF or greater, the value will be indicated by an alpha-numeric code. The letter precedes the number and expresses a numerical value to be multiplied by the number which follows.


Multiplier (1 ~ 5)
Numerical Value

Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

• Letters I and O are not used

EXAMPLE:

A1 ⟶ $10 \times 10^1 = 100$ pF

N2 ⟶ $33 \times 10^2 = 3300$ pF

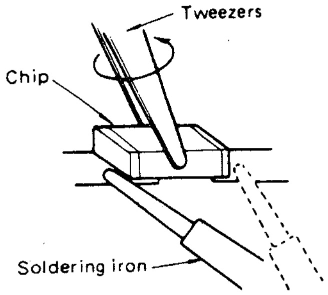
S3 ⟶ $47 \times 10^3 = 47000$ pF

5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip.
2. Use tweezers to prevent any damage to the chip surface.
3. Do not re-use the chips after removal.
4. Do not rub the electrode of chips.
5. Do not subject the chips to excessive stress.
6. It is recommended that a pencil-type soldering iron to be used.
7. The solder whose diameter is less than 0.5 mm is recommended.
8. Do not heat the chip beyond 3 seconds.
9. Maintain temperature control under 260°C (500°F) when soldering.

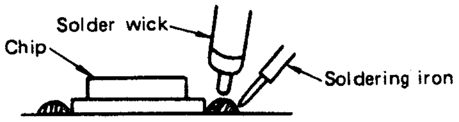
5-1 Removal (Transistor, Diode, Resistor and Capacitor)

1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning it with tweezers.
   Note: Be careful not to damage other chips.

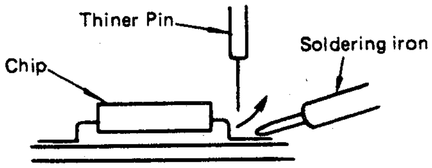

Tweezers
Chip
Soldering iron

5-2 Removal (IC)

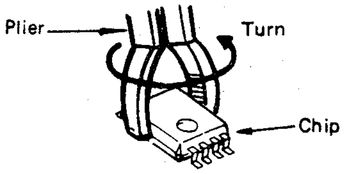
1. Add the solder wick and solder iron to each lead of the IC and remove solder.


Solder wick
Chip
Soldering iron

2. Add the solder iron to each lead of the IC and left each lead of the IC using thiner pin.

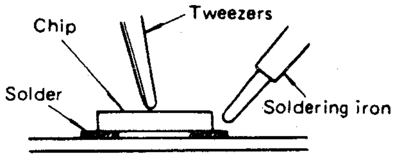

Thiner Pin
Soldering iron
Chip

3. Remove IC turning it with plier.

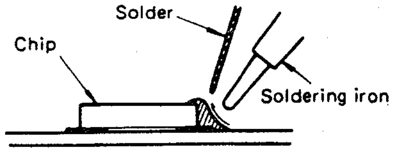

Plier
Turn
Chip

5-3 Mounting

1. Place the solder thinly on the chip mounting foil.
2. Solder the chip temporarily while holding the chip with the tweezers.

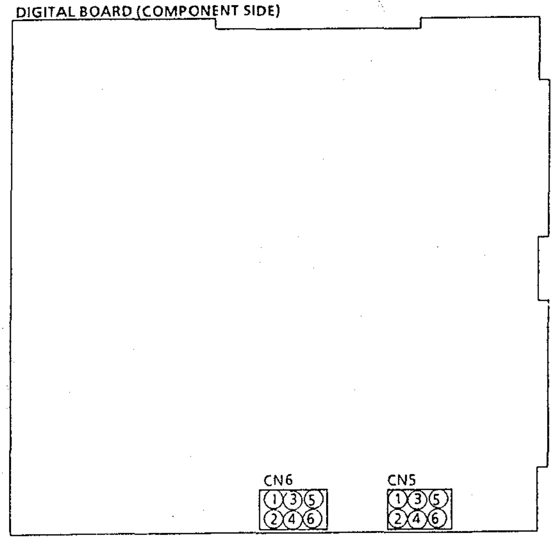

Tweezers
Chip
Solder
Soldering iron

3. Solder both ends of chip (three leads for chip transistor).

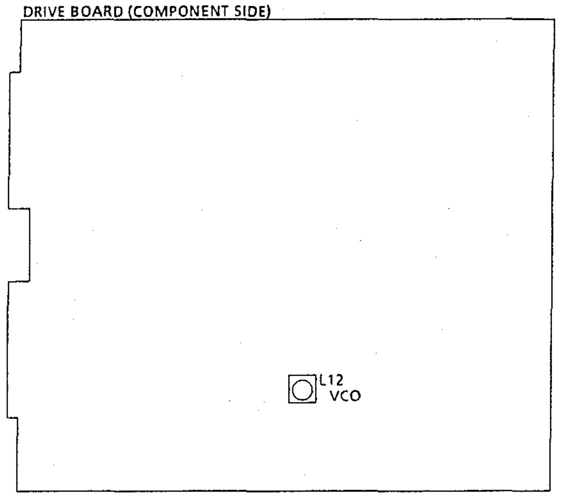

Solder
Chip
Soldering iron

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

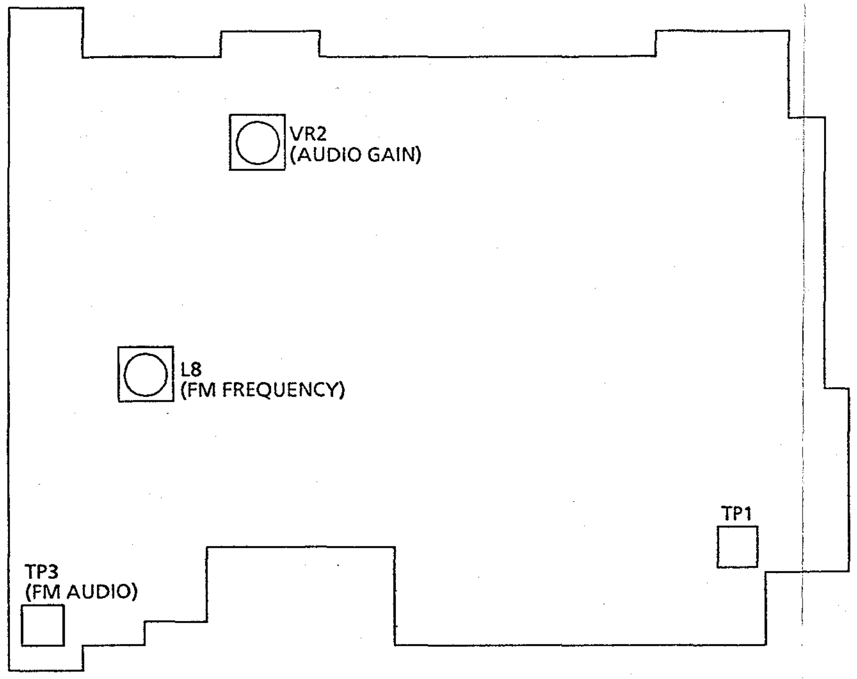
DIGITAL BOARD (COMPONENT SIDE)


CN6
1 3 5
2 4 6
CN5
1 3 5
2 4 6

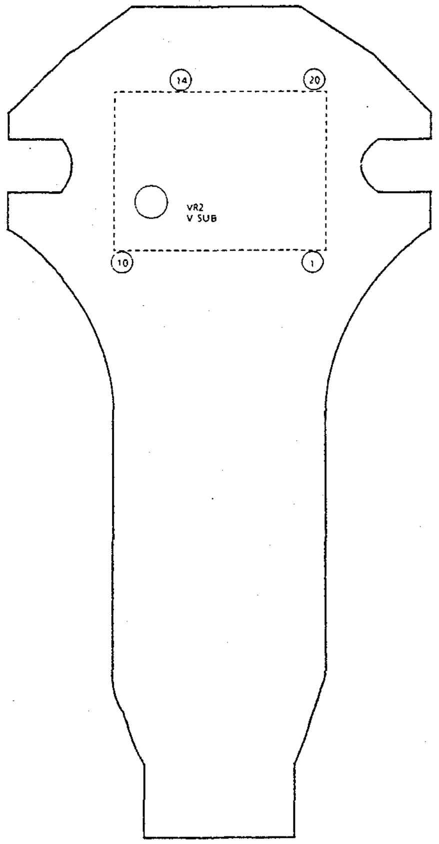
DRIVE BOARD (COMPONENT SIDE)



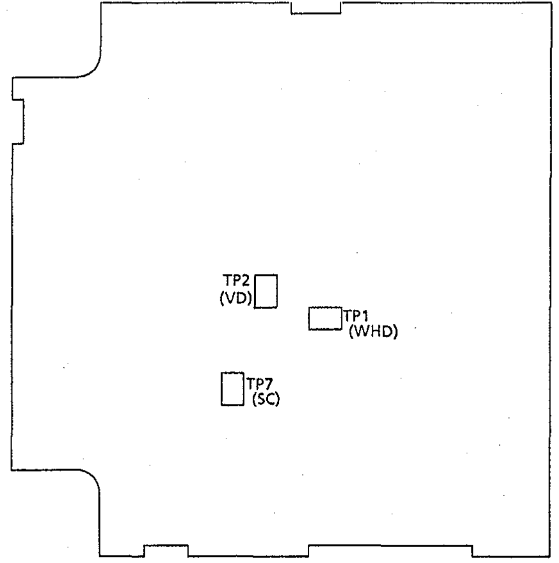
VP BOARD (COMPONENT SIDE)


VR2
(AUDIO GAIN)
L8
(FM FREQUENCY)
TP1
TP3
(FM AUDIO)

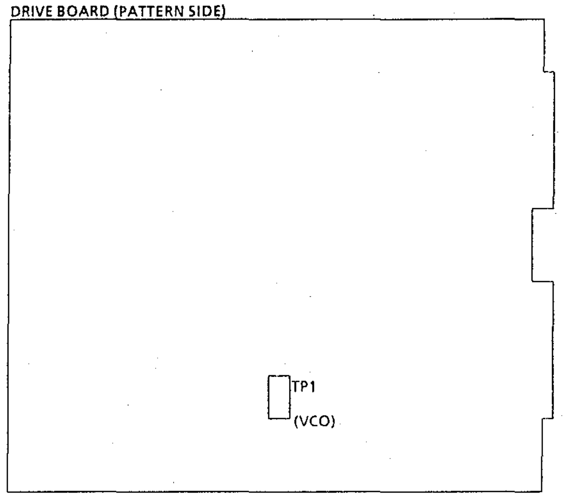
SENSOR BOARD


14
20
VR2
V SUB
10
1

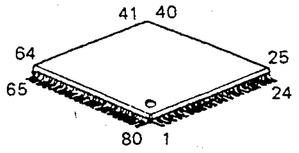
SYNC/ENCODER BOARD (PATTERN SIDE)

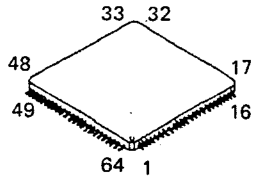

TP2
(VD)
TP1
(WHD)
TP7
(SC)

DRIVE BOARD (PATTERN SIDE)



APPEARANCE OF IC, TRANSISTOR AND DIODE


MN73069LBMZ
MN6730FHP
MN6731FHP
MN188166CCV2
41 40
64
25
65
24
80 1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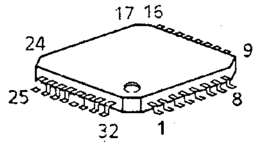
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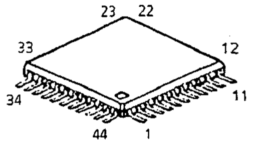
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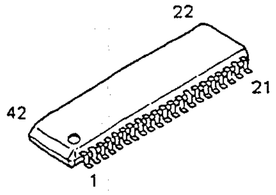
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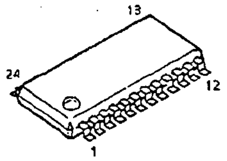
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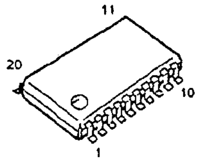
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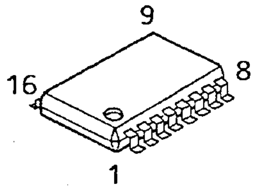
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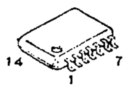
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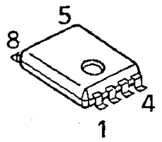
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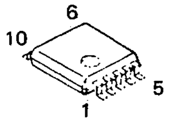
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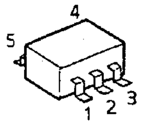
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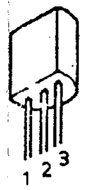
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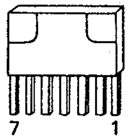
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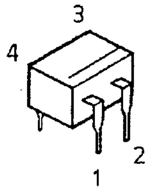
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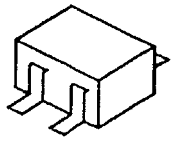
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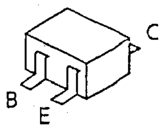
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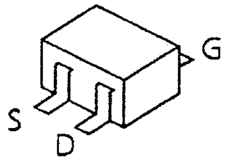
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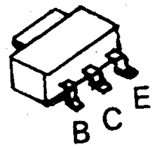
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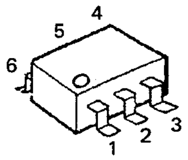
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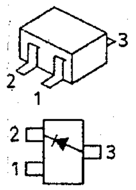
XP4501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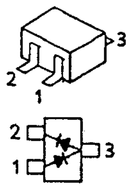
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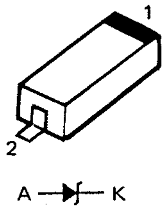
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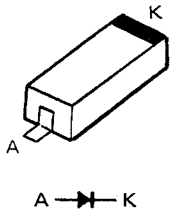
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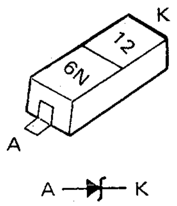
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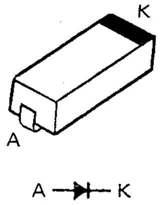
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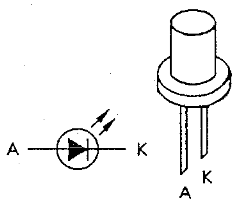
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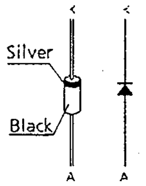
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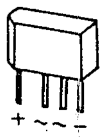
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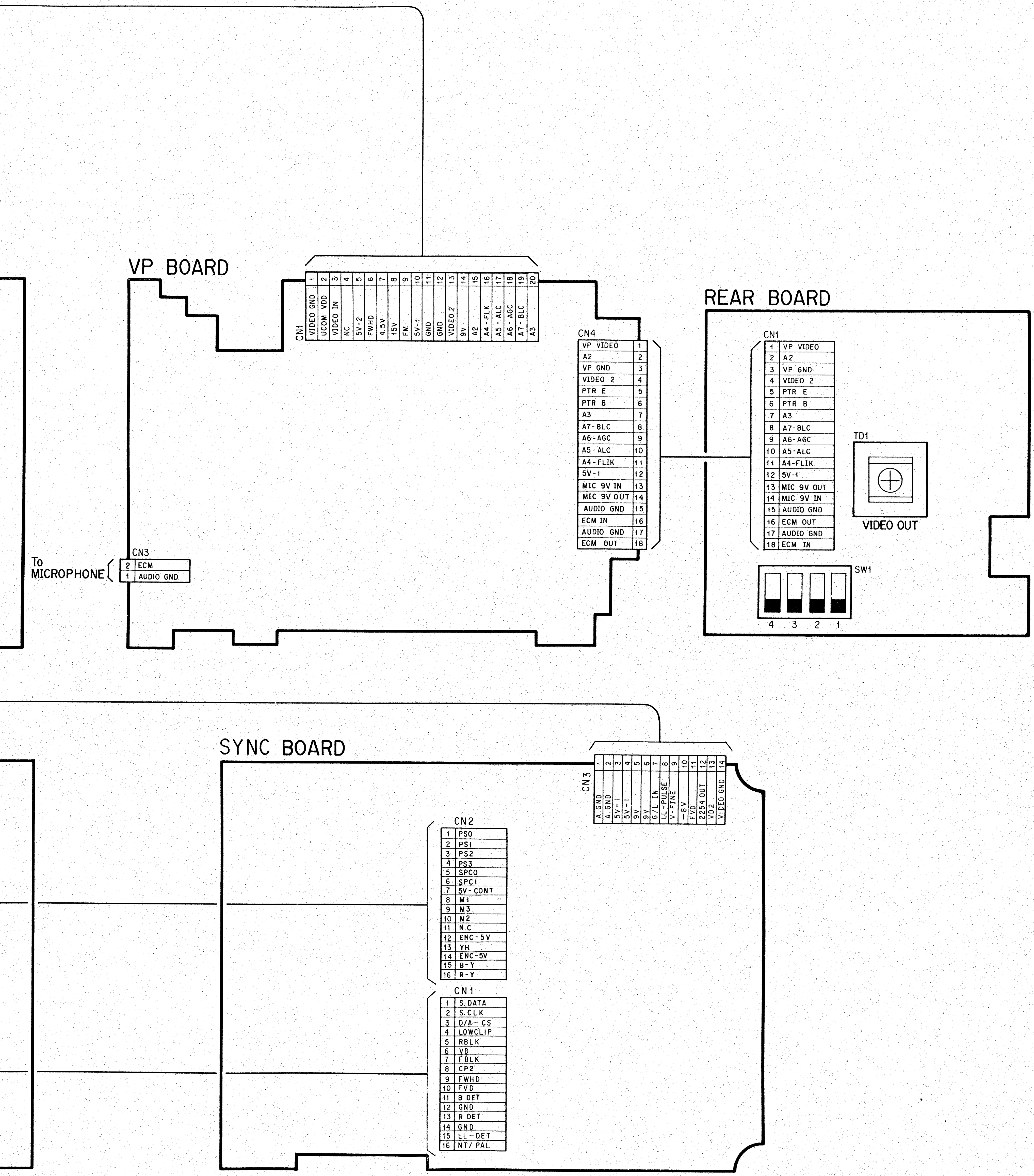
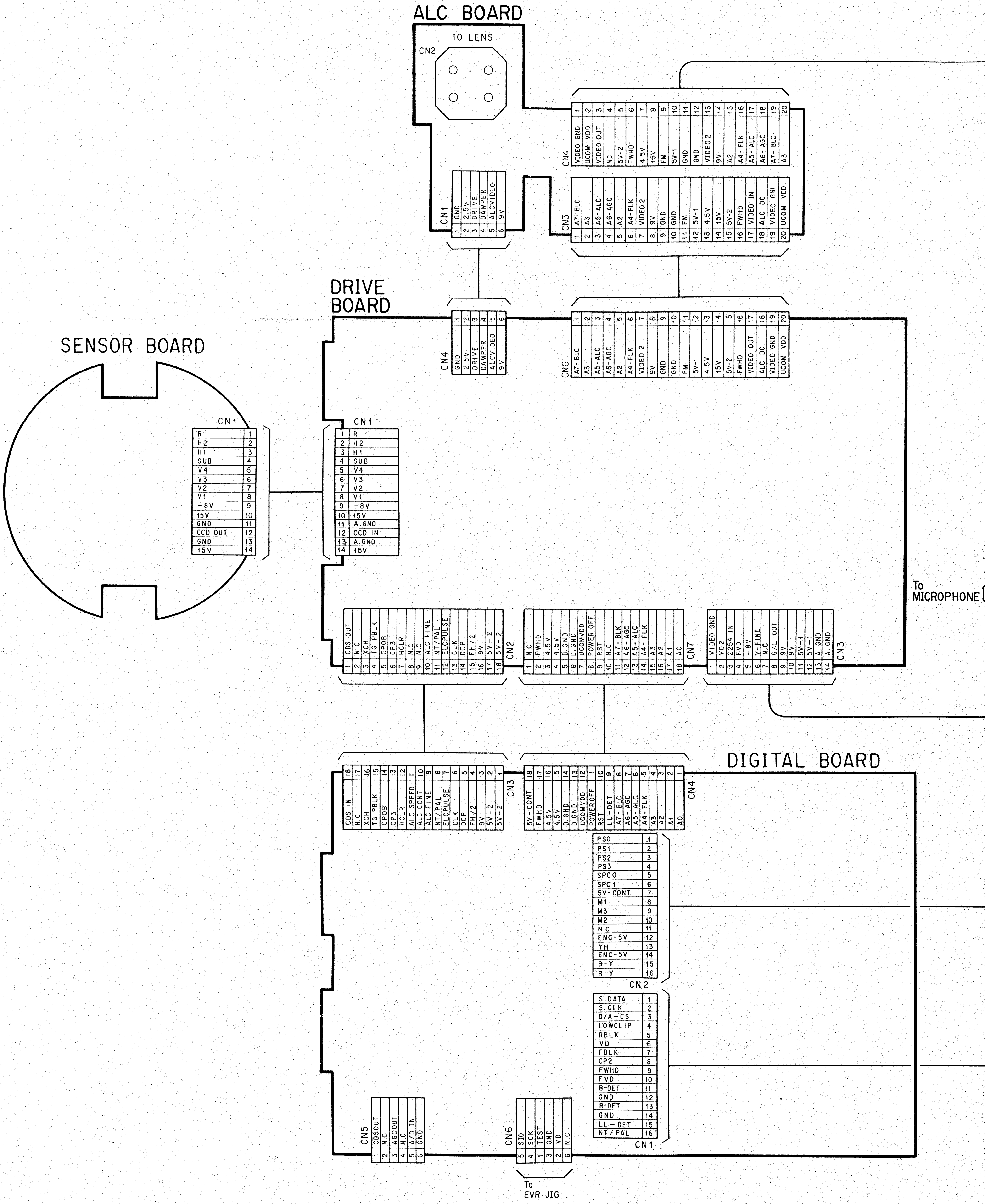
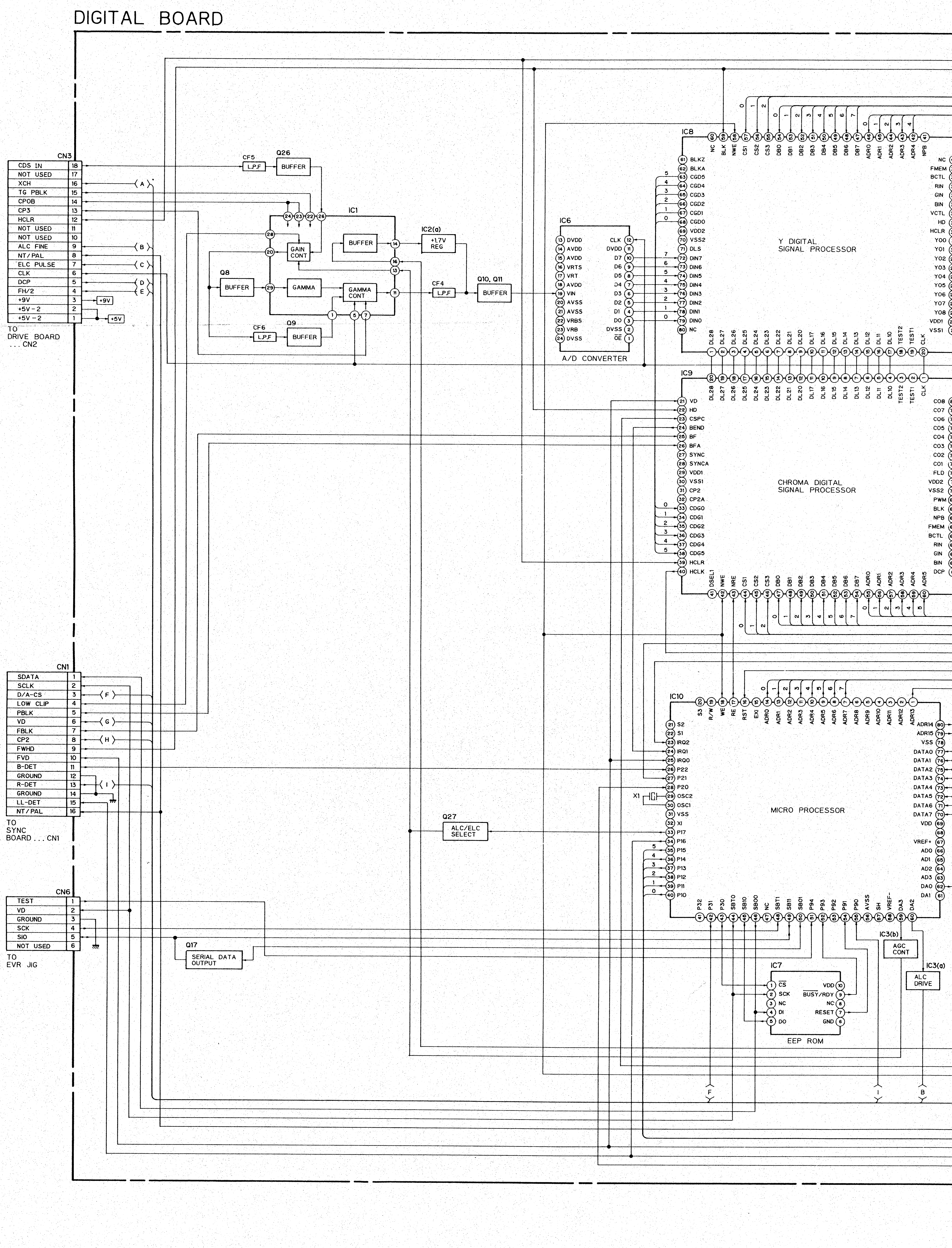
G DIAGRAM


VP BOARD
CN1
1 VIDEO GND
2 UCOM VDD
3 VIDEO IN
4 NC
5 5V-2
6 FWHD
7 4.5V
8 15V
9 FM
10 5V-1
11 GND
12 GND
13 VIDEO 2
14 9V
15 A2
16 A4-FLK
17 A5-ALC
18 A6-AGC
19 A7-BLC
20 A3
CN4
1 VP VIDEO
2 A2
3 VP GND
4 VIDEO 2
5 PTR E
6 PTR B
7 A3
8 A7-BLC
9 A6-AGC
10 A5-ALC
11 A4-FLIK
12 5V-1
13 MIC 9V IN
14 MIC 9V OUT
15 AUDIO GND
16 ECM IN
17 AUDIO GND
18 ECM OUT
To MICROPHONE
CN3
2 ECM
1 AUDIO GND
REAR BOARD
CN1
1 VP VIDEO
2 A2
3 VP GND
4 VIDEO 2
5 PTR E
6 PTR B
7 A3
8 A7-BLC
9 A6-AGC
10 A5-ALC
11 A4-FLIK
12 5V-1
13 MIC 9V OUT
14 MIC 9V IN
15 AUDIO GND
16 ECM OUT
17 AUDIO GND
18 ECM IN
TD1
VIDEO OUT
SW1
4 3 2 1
SYNC BOARD
CN3
1 A.GND
2 A.GND
3 5V-1
4 5V-1
5 9V
6 9V
7 G/L IN
8 LL-PULSE
9 V-FINE
10 -8V
11 FVD
12 2254 OUT
13 VD2
14 VIDEO GND
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPC0
6 SPC1
7 5V-CONT
8 M1
9 M3
10 N2
11 N.C
12 ENC-5V
13 YH
14 ENC-5V
15 B-Y
16 R-Y
CN1
1 S.DATA
2 S.CLK
3 D/A-CS
4 LOWCLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B DET
12 GND
13 R DET
14 GND
15 LL-DET
16 NT/PAL

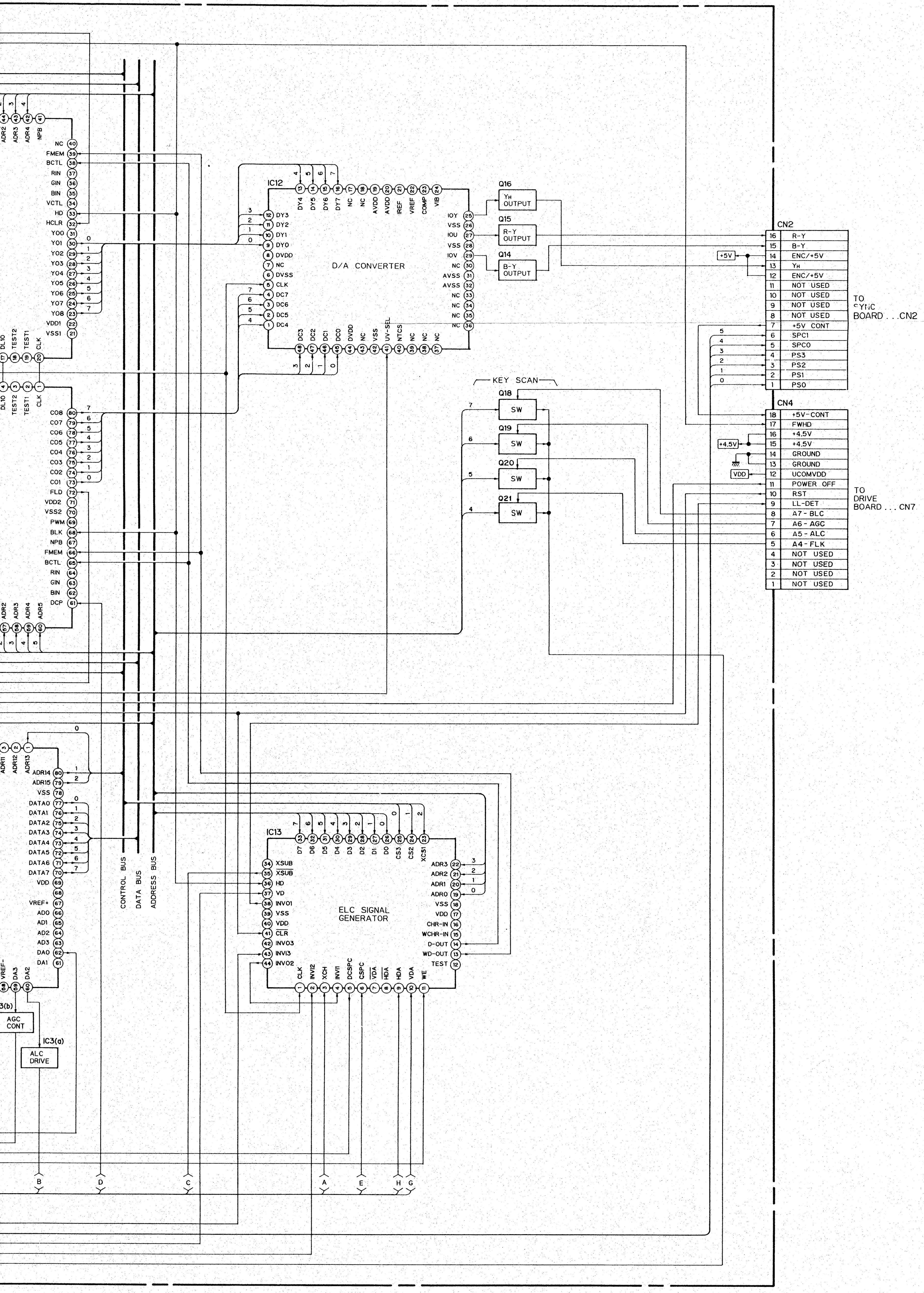
WIRING DIAGR


ALC BOARD
TO LENS
CN2
CN4
1 VIDEO GND
2 UCOM VDD
3 VIDEO OUT
4 NC
5 5V-2
6 FWHD
7 4.5V
8 15V
9 FM
10 5V-1
11 GND
12 GND
13 VIDEO 2
14 9V
15 A2
16 A4-FLK
17 A5-ALC
18 A6-AGC
19 A7-BLC
20 A3
CN1
1 GND
2 2.5V
3 DRIVE
4 DAMPER
5 ALCVIDEO
6 9V
CN3
1 A7-BLC
2 A3
3 A5-ALC
4 A6-AGC
5 A2
6 A4-FLK
7 VIDEO 2
8 9V
9 GND
10 GND
11 FM
12 5V-1
13 4.5V
14 15V
15 5V-2
16 FWHD
17 VIDEO IN
18 ALC DC
19 VIDEO GNI
20 UCOM VDD
DRIVE BOARD
CN4
1 GND
2 2.5V
3 DRIVE
4 DAMPER
5 ALCVIDEO
6 9V
CN6
1 A7-BLC
2 A3
3 A5-ALC
4 A6-AGC
5 A2
6 A4-FLK
7 VIDEO 2
8 9V
9 GND
10 GND
11 FM
12 5V-1
13 4.5V
14 15V
15 5V-2
16 FWHD
17 VIDEO OUT
18 ALC DC
19 VIDEO GND
20 UCOM VDD
SENSOR BOARD
CN1
R 1
H2 2
H1 3
SUB 4
V4 5
V3 6
V2 7
V1 8
-8V 9
15V 10
GND 11
CCD OUT 12
GND 13
15V 14
CN1
1 R
2 H2
3 H1
4 SUB
5 V4
6 V3
7 V2
8 V1
9 -8V
10 15V
11 A.GND
12 CCD IN
13 A.GND
14 15V
CN2
1 CDS OUT
2 N.C
3 XCH
4 TG PBLK
5 CPOB
6 CP3
7 HCLR
8 N.C
9 N.C
10 ALC FINE
11 NT/PAL
12 ELCPULSE
13 CLK
14 DCP
15 FH/2
16 9V
17 5V-2
18 5V-2
CN7
1 N.C
2 FWHD
3 4.5V
4 4.5V
5 D.GND
6 D.GND
7 UCOMVDD
8 POWER OFF
9 RST
10 N.C
11 A7-BLK
12 A6-AGC
13 A5-ALC
14 A4-FLK
15 A3
16 A2
17 A1
18 A0
CN3
1 VIDEO GND
2 VD2
3 2254 IN
4 FVD
5 -8V
6 V-FINE
7 N.C
8 G/L OUT
9 9V
10 9V
11 5V-1
12 5V-1
13 A.GND
14 A.GND
To MICROPHONE
DIGITAL BOARD
CN3
18 CDS IN
17 N.C
16 XCH
15 TG PBLK
14 CPOB
13 CP3
12 HCLR
11 ALC SPEED
10 ALC CONT
9 ALC FINE
8 NT/PAL
7 ELCPULSE
6 CLK
5 DCP
4 FH/2
3 9V
2 5V-2
1 5V-2
CN4
18 5V-CONT
17 FWHD
16 4.5V
15 4.5V
14 D.GND
13 D.GND
12 UCOMVDD
11 POWEROFF
10 RST
9 LL-DET
8 A7-BLC
7 A6-AGC
6 A5-ALC
5 A4-FLK
4 A3
3 A2
2 A1
1 A0
CN2
PS0 1
PS1 2
PS2 3
PS3 4
SPC0 5
SPC1 6
5V-CONT 7
M1 8
M3 9
M2 10
N C 11
ENC-5V 12
YH 13
ENC-5V 14
B-Y 15
R-Y 16
CN1
S.DATA 1
S.CLK 2
D/A-CS 3
LOWCLIP 4
RBLK 5
VD 6
FBLK 7
CP2 8
FWHD 9
FVD 10
B-DET 11
GND 12
R-DET 13
GND 14
LL-DET 15
NT/PAL 16
CN5
1 CDSOUT
2 N.C
3 AGCOUT
4 N.C
5 A/D IN
6 GND
CN6
5 SIO
4 SCK
1 TEST
3 GND
2 VD
6 N.C
To EVR JIG

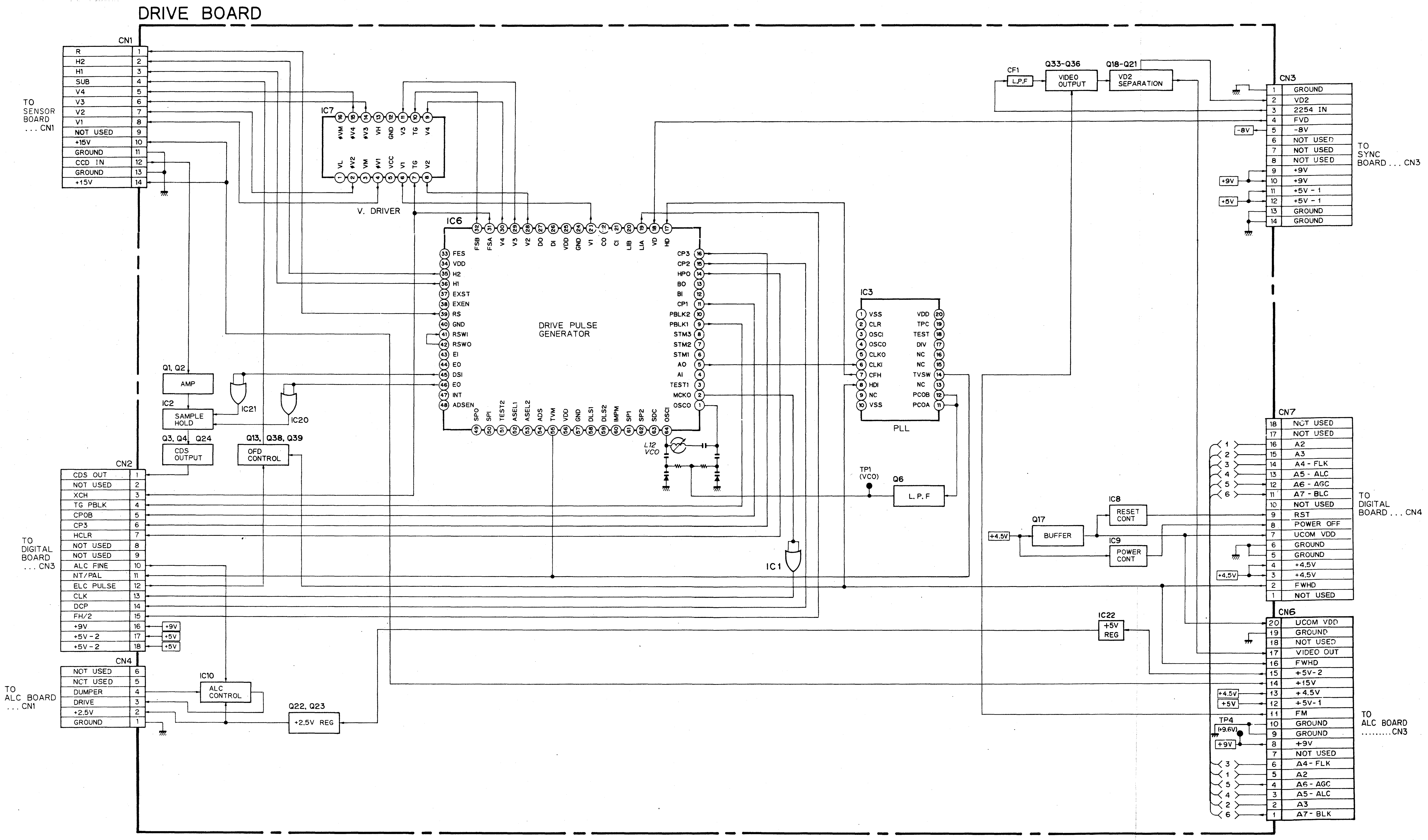
BLOCK DIAGRAM OF DIG


DIGITAL BOARD
CN3
CDS IN
NOT USED
XCH
TG PBLK
CPOB
CP3
HCLR
ALC FINE
NT/PAL
ELC PULSE
CLK
DCP
FH/2
+9V
+5V-2
TO DRIVE BOARD ... CN2
CN1
SDATA
SCLK
D/A-CS
LOW CLIP
PBLK
VD
FBLK
CP2
FWHD
FVD
B-DET
GROUND
R-DET
LL-DET
NT/PAL
TO SYNC BOARD ... CN1
CN6
TEST
SCK
SIO
TO EVR JIG
CF5
L.P.F
Q26
BUFFER
IC1
GAIN CONT
GAMMA
GAMMA CONT
Q8
Q9
CF6
IC2(a)
+1.7V REG
CF4
Q10, Q11
IC6
A/D CONVERTER
IC8
Y DIGITAL SIGNAL PROCESSOR
IC9
CHROMA DIGITAL SIGNAL PROCESSOR
IC10
MICRO PROCESSOR
X1
Q27
ALC/ELC SELECT
Q17
SERIAL DATA OUTPUT
IC7
EEP ROM
IC3(b)
AGC CONT
IC3(a)
ALC DRIVE
A
B
C
D
E
F
G
H
I

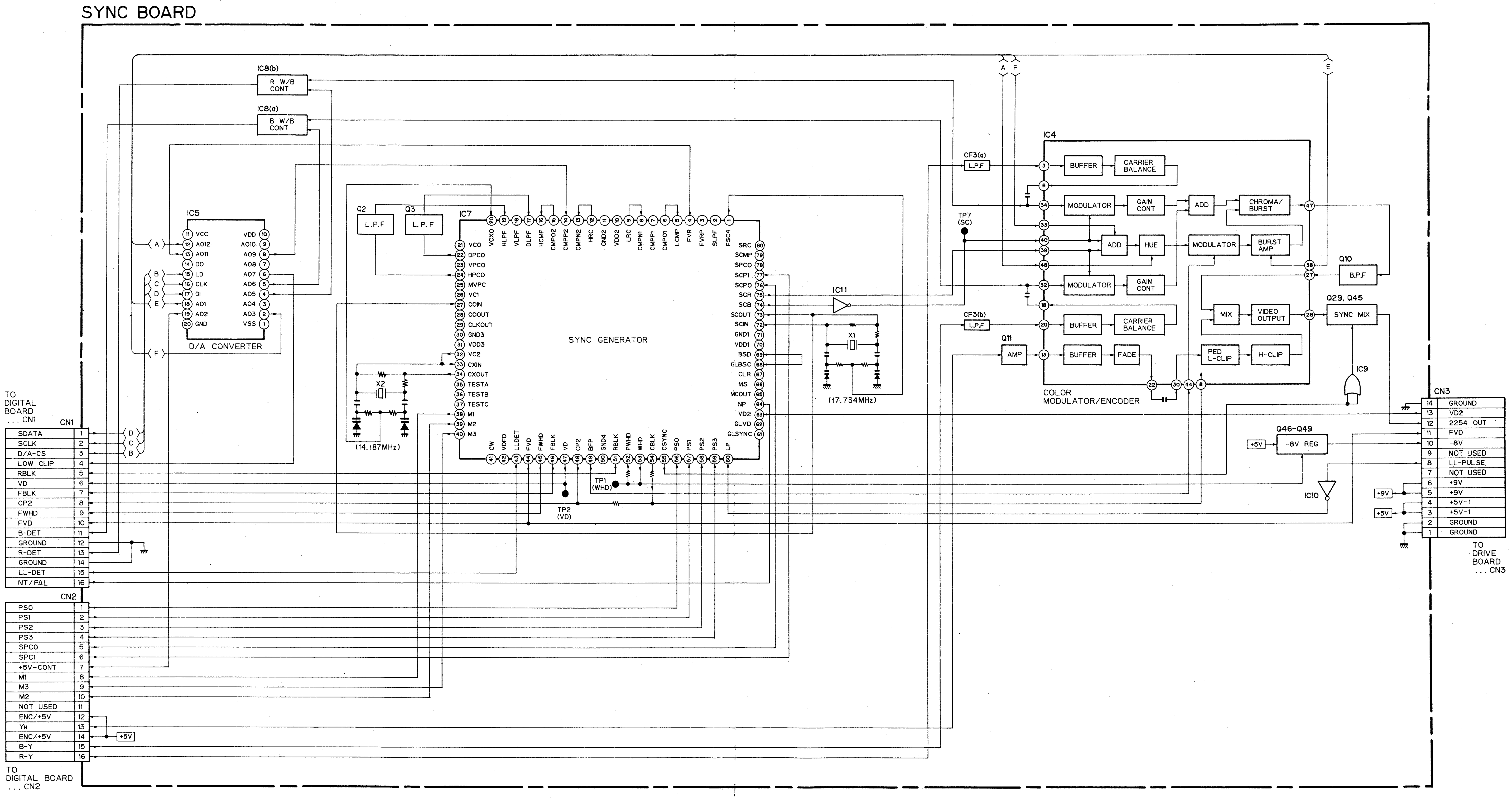
OF DIGITAL BOARD


IC12
D/A CONVERTER
DY4 DY5 DY6 DY7 NC NC AVDD AVDD IREF VREF COMP VIB
DY3 DY2 DY1 DY0 DVDD NC DVSS CLK DC7 DC6 DC5 DC4
DC3 DC2 DC1 DC0 DVDD NC VSS UV-SEL NTCS NC NC NC
IOY VSS IOU VSS IOV NC AVSS AVSS NC NC NC NC
Q16 YH OUTPUT
Q15 R-Y OUTPUT
Q14 B-Y OUTPUT
+5V
KEY SCAN
Q18 SW
Q19 SW
Q20 SW
Q21 SW
+4.5V
VDD
CN2
16 R-Y
15 B-Y
14 ENC/+5V
13 YH
12 ENC/+5V
11 NOT USED
10 NOT USED
9 NOT USED
8 NOT USED
7 +5V CONT
6 SPC1
5 SPC0
4 PS3
3 PS2
2 PS1
1 PS0
TO SYNC BOARD . . . CN2
CN4
18 +5V-CONT
17 FWHD
16 +4.5V
15 +4.5V
14 GROUND
13 GROUND
12 UCOMVDD
11 POWER OFF
10 RST
9 LL-DET
8 A7-BLC
7 A6-AGC
6 A5-ALC
5 A4-FLK
4 NOT USED
3 NOT USED
2 NOT USED
1 NOT USED
TO DRIVE BOARD . . . CN7
ADR2 ADR3 ADR4 NPB
NC FMEM BCTL RIN GIN BIN VCTL HD HCLR
YO0 YO1 YO2 YO3 YO4 YO5 YO6 YO7 YO8 VDD1 VSS1
DL10 TEST2 TEST1 CLK
CO8 CO7 CO6 CO5 CO4 CO3 CO2 CO1 FLD VDD2 VSS2 PWM BLK NPB FMEM BCTL RIN GIN BIN DCP
ADR2 ADR3 ADR4 ADR5
ADR11 ADR12 ADR13 ADR14 ADR15 VSS
DATA0 DATA1 DATA2 DATA3 DATA4 DATA5 DATA6 DATA7 VDD
VREF+ AD0 AD1 AD2 AD3 DA0 DA1
VREF- DA3 DA2
3(b) AGC CONT
IC3(a) ALC DRIVE
CONTROL BUS
DATA BUS
ADDRESS BUS
IC13
ELC SIGNAL GENERATOR
D7 D6 D5 D4 D3 D2 D1 D0 CS3 CS2 XCS1
XSUB XSUB HD VD INVO1 VSS VDD CLR INVO3 INVI3 INVO2
ADR3 ADR2 ADR1 ADR0 VSS VDD CHR-IN WCHR-IN D-OUT WD-OUT TEST
CLK INVI2 XCH INVI1 DCSPC CSPC VDA HDA HDA VDA WE
B D C A E H G

BLOCK DIAGRAM OF DRIVE BOARD


DRIVE BOARD
CN1
R 1
H2 2
H1 3
SUB 4
V4 5
V3 6
V2 7
V1 8
NOT USED 9
+15V 10
GROUND 11
CCD IN 12
GROUND 13
+15V 14
TO SENSOR BOARD ... CN1
IC7
ϕVM 16
ϕV4 15
ϕV3 14
VH 13
GND 12
V3 11
TG 10
V4 9
VL 1
ϕV2 2
VM 3
ϕV1 4
VCC 5
V1 6
TG 7
V2 8
V. DRIVER
IC6
FSB 32
FSA 31
V4 30
V3 29
V2 28
DO 27
DI 26
VDD 25
GND 24
V1 23
CO 22
CI 21
LIB 20
LIA 19
VD 18
HD 17
FES 33
VDD 34
H2 35
H1 36
EXST 37
EXEN 38
RS 39
GND 40
RSWI 41
RSWO 42
EI 43
EO 44
DSI 45
EO 46
INT 47
ADSEN 48
DRIVE PULSE GENERATOR
CP3 16
CP2 15
HPO 14
BO 13
BI 12
CP1 11
PBLK2 10
PBLK1 9
STM3 8
STM2 7
STM1 6
AO 5
AI 4
TEST1 3
MCKO 2
OSCO 1
SPO 49
SPI 50
TEST2 51
ASEL1 52
ASEL2 53
ADS 54
TVM 55
VDD 56
GND 57
DLS1 58
DLS2 59
MPM 60
SP1 61
SP2 62
SDC 63
OSCI 64
L12 VCO
Q1, Q2
AMP
IC2
SAMPLE HOLD
IC21
IC20
Q3, Q4, Q24
CDS OUTPUT
Q13, Q38, Q39
OFD CONTROL
CN2
CDS OUT 1
NOT USED 2
XCH 3
TG PBLK 4
CPOB 5
CP3 6
HCLR 7
NOT USED 8
NOT USED 9
ALC FINE 10
NT/PAL 11
ELC PULSE 12
CLK 13
DCP 14
FH/2 15
+9V 16
+5V-2 17
+5V-2 18
+9V
+5V
+5V
TO DIGITAL BOARD ... CN3
CN4
NOT USED 6
NOT USED 5
DUMPER 4
DRIVE 3
+2.5V 2
GROUND 1
TO ALC BOARD ... CN1
IC10
ALC CONTROL
Q22, Q23
+2.5V REG
IC1
IC3
VSS 1
CLR 2
OSCI 3
OSCO 4
CLKO 5
CLKI 6
CFH 7
HDI 8
NC 9
VSS 10
VDD 20
TPC 19
TEST 18
DIV 17
NC 16
NC 15
TVSW 14
NC 13
PCOB 12
PCOA 11
PLL
TP1 (VCO)
Q6
L.P.F
CF1
L.P.F
Q33-Q36
VIDEO OUTPUT
Q18-Q21
VD2 SEPARATION
CN3
GROUND 1
VD2 2
2254 IN 3
FVD 4
-8V 5
NOT USED 6
NOT USED 7
NOT USED 8
+9V 9
+9V 10
+5V-1 11
+5V-1 12
GROUND 13
GROUND 14
-8V
+9V
+5V
TO SYNC BOARD ... CN3
CN7
NOT USED 18
NOT USED 17
A2 16
A3 15
A4-FLK 14
A5-ALC 13
A6-AGC 12
A7-BLC 11
NOT USED 10
RST 9
POWER OFF 8
UCOM VDD 7
GROUND 6
GROUND 5
+4.5V 4
+4.5V 3
FWHD 2
NOT USED 1
1
2
3
4
5
6
TO DIGITAL BOARD ... CN4
IC8
RESET CONT
Q17
BUFFER
+4.5V
IC9
POWER CONT
+4.5V
IC22
+5V REG
CN6
UCOM VDD 20
GROUND 19
NOT USED 18
VIDEO OUT 17
FWHD 16
+5V-2 15
+15V 14
+4.5V 13
+5V-1 12
FM 11
GROUND 10
GROUND 9
+9V 8
NOT USED 7
A4-FLK 6
A2 5
A6-AGC 4
A5-ALC 3
A3 2
A7-BLK 1
+4.5V
+5V
TP4
(+9.6V)
+9V
3
1
5
4
2
6
TO ALC BOARD CN3

BLOCK DIAGRAM OF SYNC BOARD

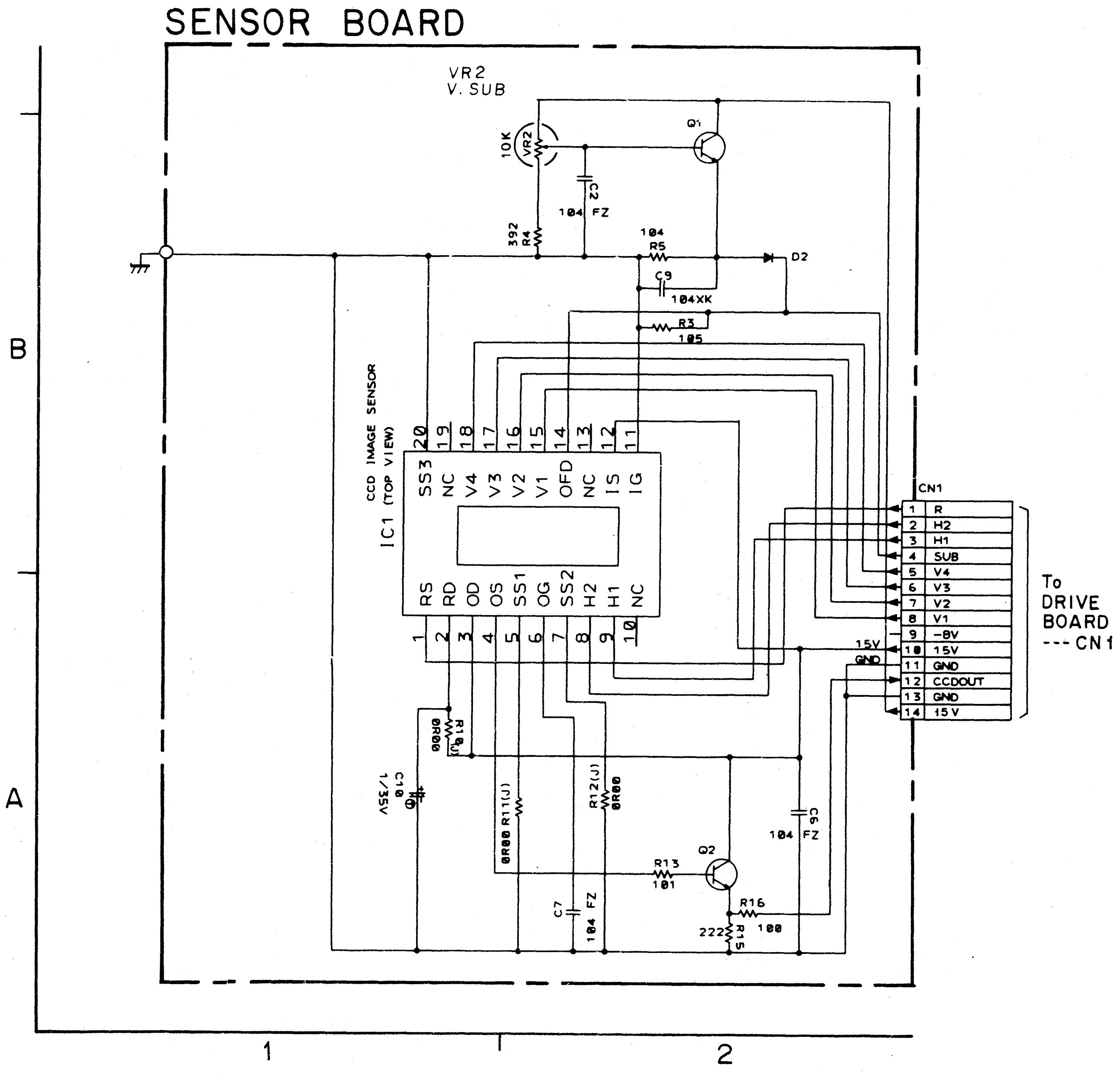

SYNC BOARD
IC8(b)
R W/B CONT
IC8(a)
B W/B CONT
IC5
D/A CONVERTER
VCC
AO12
AO11
DO
LD
CLK
DI
AO1
AO2
GND
VDD
AO10
AO9
AO8
AO7
AO6
AO5
AO4
AO3
VSS
Q2
Q3
L.P.F
IC7
SYNC GENERATOR
VCO
DPCO
VPCO
HPCO
MVPC
VC1
COIN
COOUT
CLKOUT
GND3
VDD3
VC2
CXIN
CXOUT
TESTA
TESTB
TESTC
M1
M2
M3
VCXO
HLPF
VLPF
DLPF
HCMP
CMPO2
CMPP2
CMPN2
HRC
GND2
VDD2
LRC
CMPN1
CMPP1
CMPO1
LCMP
FVR
FVRP
SLPF
FSC4
SRC
SCMP
SPCO
SCP1
SCPO
SCR
SCB
SCOUT
SCIN
GND1
VDD1
BSD
GLBSC
CLR
MS
MCOUT
NP
VD2
GLVD
GLSYNC
CW
VDFD
LLDET
FVD
FWHD
FBLK
VD
CP2
BFP
GND4
RBLK
PWHD
WHD
CBLK
CSYNC
PS0
PS1
PS2
PS3
LP
X2
(14.187MHz)
TP1 (WHD)
TP2 (VD)
IC11
X1
(17.734MHz)
TP7 (SC)
CF3(a)
CF3(b)
L.P.F
Q11
AMP
IC4
BUFFER
CARRIER BALANCE
MODULATOR
GAIN CONT
ADD
HUE
CHROMA/ BURST
BURST AMP
MIX
VIDEO OUTPUT
FADE
PED L-CLIP
H-CLIP
COLOR MODULATOR/ENCODER
Q10
B.P.F
Q29, Q45
SYNC MIX
IC9
Q46-Q49
+5V
-8V REG
IC10
A
B
C
D
E
F
TO DIGITAL BOARD ... CN1
CN1
1 SDATA
2 SCLK
3 D/A-CS
4 LOW CLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B-DET
12 GROUND
13 R-DET
14 GROUND
15 LL-DET
16 NT/PAL
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPC0
6 SPC1
7 +5V-CONT
8 M1
9 M3
10 M2
11 NOT USED
12 ENC/+5V
13 YH
14 ENC/+5V
15 B-Y
16 R-Y
+5V
TO DIGITAL BOARD ... CN2
CN3
14 GROUND
13 VD2
12 2254 OUT
11 FVD
10 -8V
9 NOT USED
8 LL-PULSE
7 NOT USED
6 +9V
5 +9V
4 +5V-1
3 +5V-1
2 GROUND
1 GROUND
+9V
+5V
TO DRIVE BOARD ... CN3

SCHEMATIC DIAGRAM OF SENSOR BOARD

<Index>

SENSOR BOARD

Q1	B2
Q2	A2
D2	B2



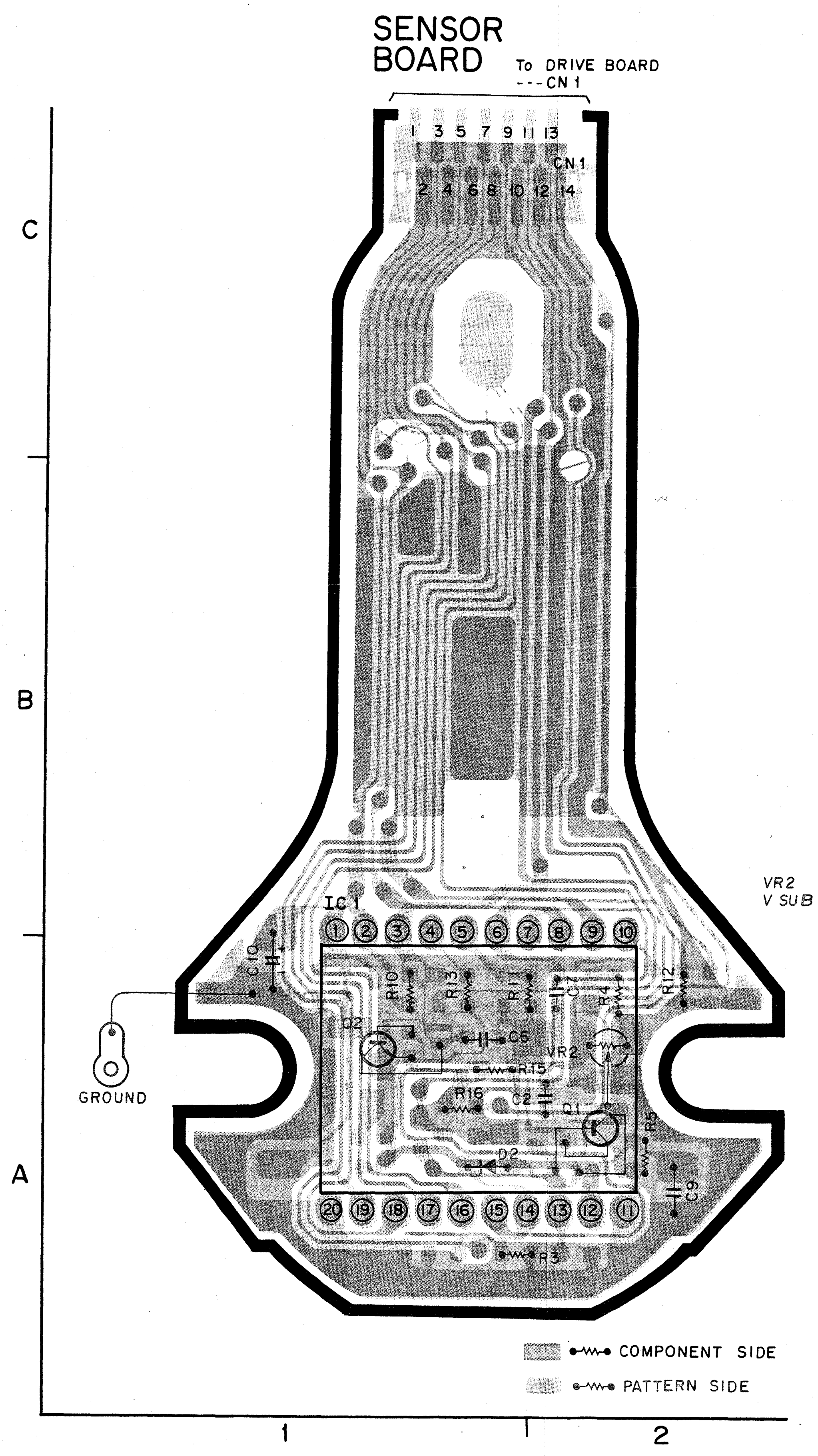
SENSOR BOARD
VR2
V. SUB
10K
VR2
Q1
C2
104 FZ
392
R4
104
R5
D2
C9
104XK
R3
105
CCD IMAGE SENSOR
(TOP VIEW)
IC1
SS3
NC
V4
V3
V2
V1
OFD
NC
IS
IG
RS
RD
OD
OS
SS1
OG
SS2
H2
H1
NC
CN1
1 R
2 H2
3 H1
4 SUB
5 V4
6 V3
7 V2
8 V1
9 -8V
10 15V
11 GND
12 CCDOUT
13 GND
14 15V
15V
GND
To
DRIVE
BOARD
---CN1
0R00
R10(J)
C10
1/35V
R11(J)
0R00
R12(J)
0R00
C6
104 FZ
Q2
R13
101
R16
100
222
R15
C7
104 FZ
B
A
1
2

CONDUCTOR VIEW OF SENSOR BOARD

<Index>

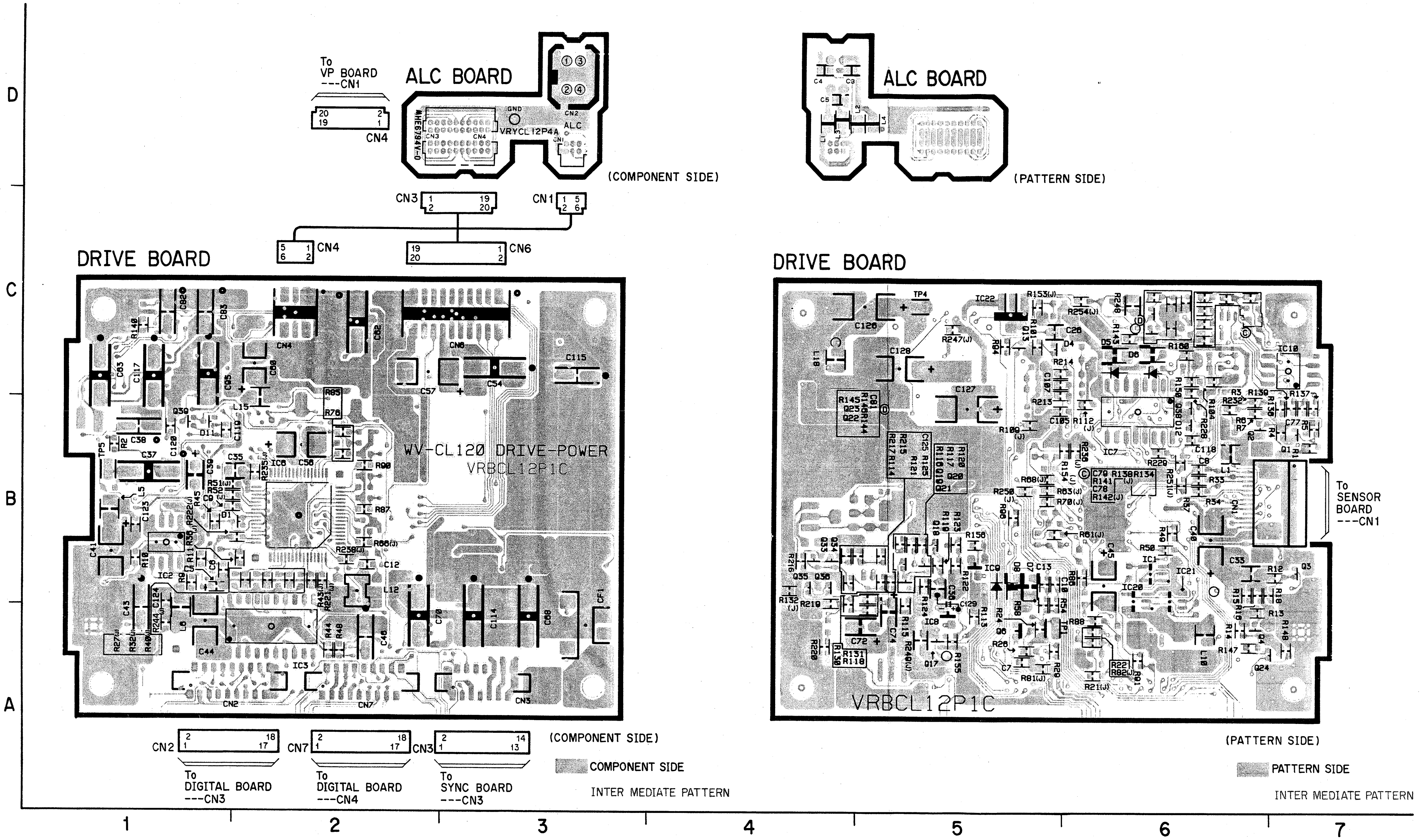
SENSOR BOARD

Q1	A2
Q2	A1
D2	A1



SENSOR BOARD
To DRIVE BOARD
---CN1
1 3 5 7 9 11 13
CN1
2 4 6 8 10 12 14
IC1
C10
R10
R13
R11
C7
R4
R12
Q2
C6
VR2
R15
R16
C2
Q1
R5
D2
C9
R3
VR2
V SUB
GROUND
COMPONENT SIDE
PATTERN SIDE
C
B
A
1
2

CONDUCTOR VIEW OF DRIVE BOARD


To
VP BOARD
---CN1
CN4
ALC BOARD
VRYCL12P4A
(COMPONENT SIDE)
CN3
CN1
CN4
CN6
ALC BOARD
(PATTERN SIDE)
DRIVE BOARD
WV-CL120 DRIVE-POWER
VRBCL12P1C
DRIVE BOARD
VRBCL12P1C
To
SENSOR
BOARD
---CN1
CN2
CN7
CN3
To
DIGITAL BOARD
---CN3
To
DIGITAL BOARD
---CN4
To
SYNC BOARD
---CN3
(COMPONENT SIDE)
COMPONENT SIDE
INTER MEDIATE PATTERN
(PATTERN SIDE)
PATTERN SIDE
INTER MEDIATE PATTERN
D
C
B
A
1
2
3
4
5
6
7

	IC1	IC2	IC3	IC7	IC8	IC9	IC10	IC20	IC21
Pin 1	2.9	4.8	0	-7.8	0	0	2.3	1.3	1.1
2	2.9	2.6	4.8	-7.5	4.4	4.5	2.3	1.3	1.1
3	0.5	2.6	0	0	4.5	4.5	2.3	0	0
4	2.9	4.8	4.8	-0.2			0	0.5	0.4
5	5.4	1.2	0	4.8			2.3	4.8	4.8
6		1.2	2.3	0.1			2.3		
7		0	0.4	4.8			4.1		
8		1.8	0.6	0			0		
9			0	0.1					
10			0	4.8					
11			2.0	4.6					
12			2.0	0					
13			0	14.6					
14			0	-7.4					
15			0	00.2					
16			0	0					
17			4.8						
18			4.8						
19			4.8						
20			4.8						

	IC6		IC6
Pin 1	0	Pin 33	4.7
2	2.0	34	4.8
3	0	35	1.8
4	0	36	2.4
5	0	37	0
6	4.8	38	0
7	0	39	1.5
8	0	40	0
9	0	41	1.1
10	0.7	42	8.5
11	0	43	0
12	0	44	0
13	0	45	1.1
14	0.5	46	1.4
15	0.1	47	0
16	0	48	4.8
17	0.4	49	0
18	0.1	50	0
19	2.4	51	0
20	2.4	52	0
21	0	53	0
22	4.8	54	4.8
23	0.1	55	0
24	0	56	0
25	4.8	57	0
26	0	58	0
27	4.8	59	0
28	4.6	60	0
29	4.6	61	0
30	0.1	62	0
31	4.8	63	0
32	4.8	64	0

	B	C	E
Q1	3.0	6.9	2.2
2	8.6	8.7	7.9
3	1.7	8.7	1.4
4	1.7	5.4	1.05
6	2.3	2.0	4.8

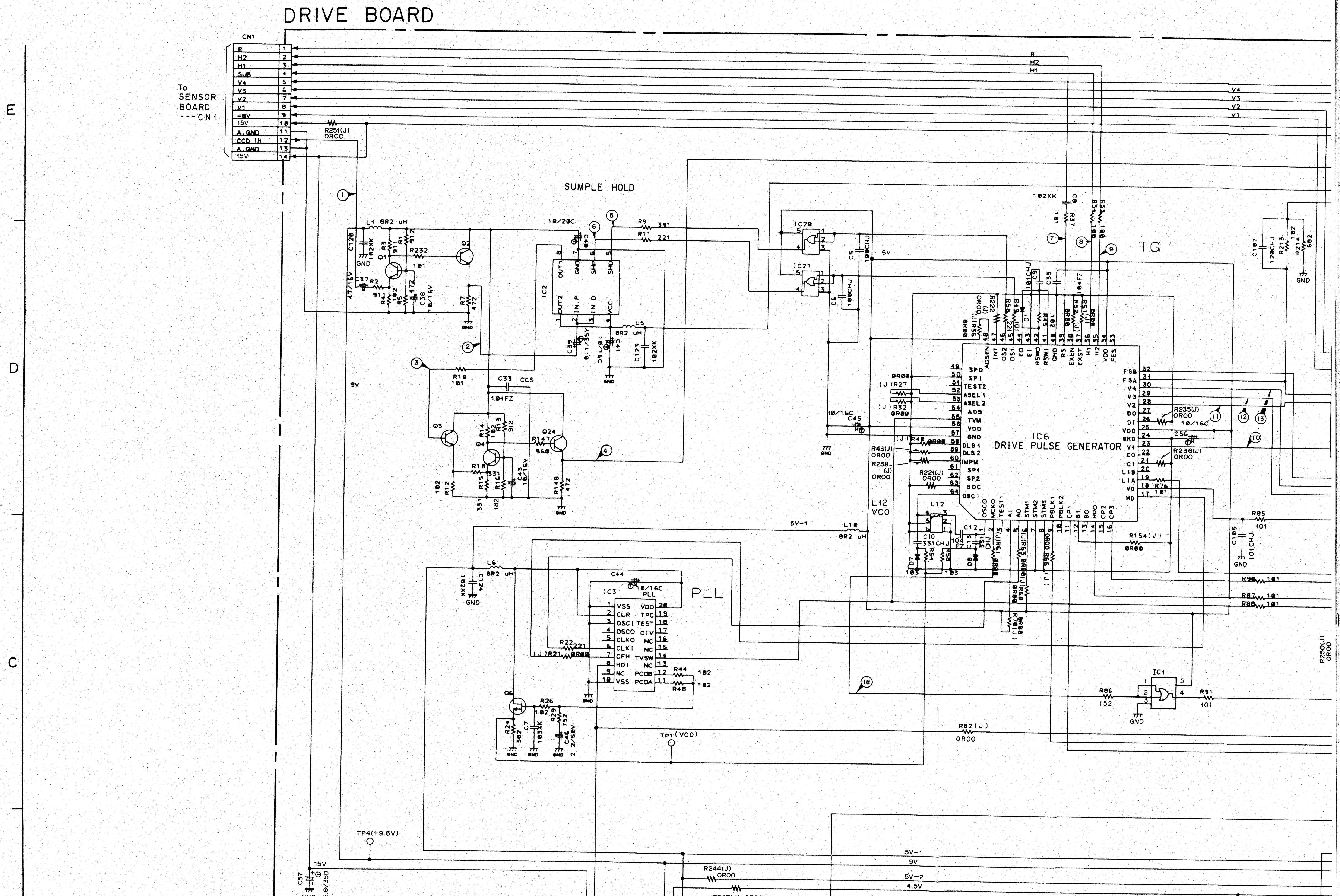
	B	C	E
13	0.1	7.1	0
17	3.6	4.3	4.4
18	8.0	8.7	8.7
19	2.8	7.1	2.2
20	2.0	2.2	1.4
21	2.2	8.7	2.2
22	3.0	4.8	2.3
23	2.4	0	3.0

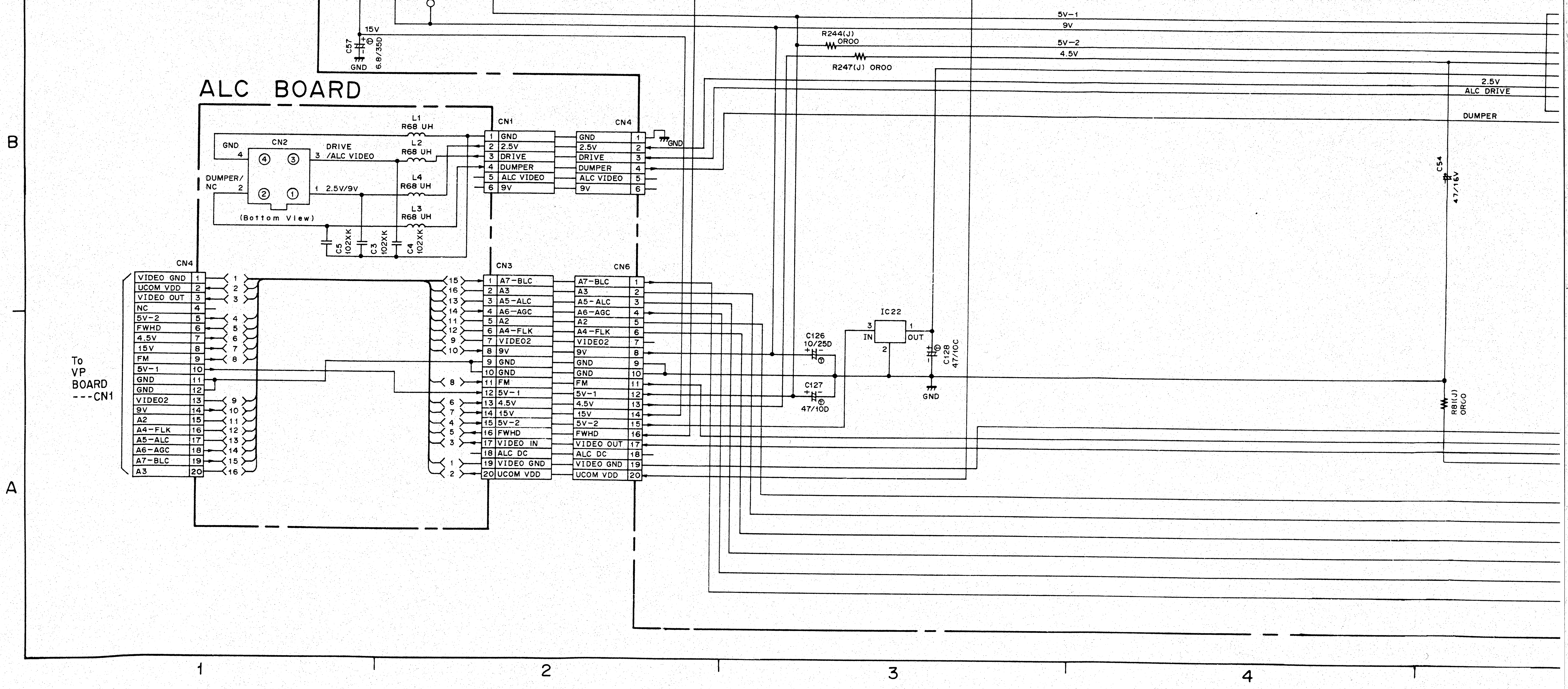
	B	C	E
24	5.4	8.7	4.7
33	6.7	2.2	7.3
34	6.7	2.2	7.3
35	1.6	0	2.2
36	1.6	0	2.2
38	0	12.7	0
39	23.4	-	24.0

DRIVE BOARD

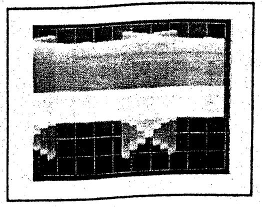
IC1	B6	Q1	B7	Q22	C6	D5	B6
IC2	B1	Q2	B6	Q23	C6	D6	B6
IC3	A2	Q3	B7	Q24	A6	D7	B5
IC6	B2	Q4	A6	Q33	B4	D8	B5
IC7	B6	Q6	A5	Q34	B4	D11	E1
IC8	A5	Q13	C5	Q35	B4	D12	B6
IC9	B5	Q17	A5	Q36	B4		
IC10	C7	Q18	B5	Q38	B6		
IC20	B6	Q19	B5	Q39	B1		
IC21	B6	Q20	B5	D1	B1		
IC22	C5	Q21	B5	D4	B6		

SCHEMATIC DIAGRAM OF DRIVE BOAR

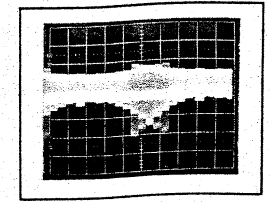

DRIVE BOARD
E
D
C
To SENSOR BOARD ---CN1
CN1
R
H2
H1
SUB
V4
V3
V2
V1
-8V
15V
A.GND
CCD IN
A.GND
15V
R251(J) OR00
SUMPLE HOLD
IC2
OUT1
GND
SHP
SHD
OUT2
IN.P
IN.D
VCC
L1 8R2 uH
C120 102XK
C37 47/16V
C38 10/16V
C39 0.1/35V
C40 10/20C
C41 10/16C
C123 102XK
L5 8R2 uH
R9 391
R11 221
R232 101
R19 101
C33 CCS 104FZ
R147 560
R148 472
Q1
Q2
Q3
Q4
Q24
Q6
9V
IC20
IC21
C5 100CHJ
C6 100CHJ
5V
TG
102XK C8
R37 101
R34 100
R33 100
IC6
DRIVE PULSE GENERATOR
SPO
SP1
TEST2
ASEL1
ASEL2
ADS
TVM
VDD
GND
DLS1
DLS2
IMPM
SP1
SP2
SDC
OSC1
ADSEN
INT
DS2
DS1
EO
EI
RSWO
RSWI
GND
RS
EXEN
EXST
H1
H2
VDD
FES
FSB
FSA
V4
V3
V2
DO
DI
VDD
GND
V1
CO
CI
L1B
L1A
VD
HD
OSCO
MCKO
TEST1
A1
AO
STM1
STM2
STM3
PBLK1
PBLK2
CP1
BI
BO
HPO
CP2
CP3
R235(J) OR00
R236(J) OR00
C56 10/16C
C45 10/16C
R76 101
R85 101
C105 101CHJ
R154(J) OR00
R90 101
R87 101
R88 101
C107 120CHJ
R213 102
R214 682
L12 VCO
L10 8R2 uH
C10 331CHJ
C12
5V-1
L6 8R2 uH
C124 102XK
C44 10/16C
IC3 PLL
PLL
VSS
CLR
OSCI
OSCO
CLKO
CLKI
CFH
HDI
NC
VSS
VDD
TPC
TEST
DIV
NC
NC
TVSW
NC
PCOB
PCOA
R22 221
(J)R21 0R00
R44 102
R48 102
R26 102
R24 302
C7 103XK
R29 752
C46 2.2/50V
TP1(VCO)
R82(J) OR00
IC1
R86 152
R91 101
R250(J) OR00
TP4(+9.6V)
C57 6.8/35D
15V
R244(J) OR00
5V-1
9V
5V-2
4.5V
GND
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑱


ALC BOARD
B
A
1
2
3
4
15V
C57
6.8/35D
GND
5V-1
9V
5V-2
4.5V
R244(J)
OROO
R247(J) OROO
2.5V
ALC DRIVE
DUMPER
L1
R68 UH
L2
R68 UH
L4
R68 UH
L3
R68 UH
CN1
CN2
CN3
CN4
CN6
GND
DRIVE
/ALC VIDEO
DUMPER/
NC
2.5V/9V
(Bottom View)
C5
102XK
C3
102XK
C4
102XK
1 GND
2 2.5V
3 DRIVE
4 DUMPER
5 ALC VIDEO
6 9V
To
VP
BOARD
---CN1
VIDEO GND 1
UCOM VDD 2
VIDEO OUT 3
NC 4
5V-2 5
FWHD 6
4.5V 7
15V 8
FM 9
5V-1 10
GND 11
GND 12
VIDEO2 13
9V 14
A2 15
A4-FLK 16
A5-ALC 17
A6-AGC 18
A7-BLC 19
A3 20
1 A7-BLC
2 A3
3 A5-ALC
4 A6-AGC
5 A2
6 A4-FLK
7 VIDEO2
8 9V
9 GND
10 GND
11 FM
12 5V-1
13 4.5V
14 15V
15 5V-2
16 FWHD
17 VIDEO IN
18 ALC DC
19 VIDEO GND
20 UCOM VDD
VIDEO OUT
IC22
IN
OUT
C126
10/25D
C127
47/10D
C128
47/10C
C54
47/16V
R81(J)
OROO

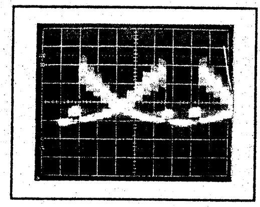
1. 10μsec/DIV,0.2V/DIV



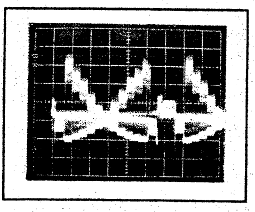
2. 10μsec/DIV,0.2V/DIV



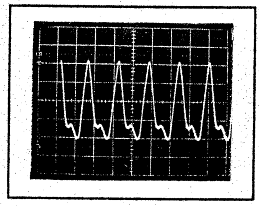
3. 10μsec/DIV,0.2V/DIV



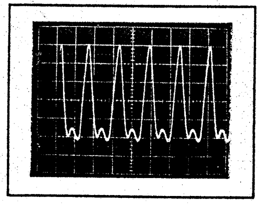
4. 10μsec/DIV,50mV/DIV



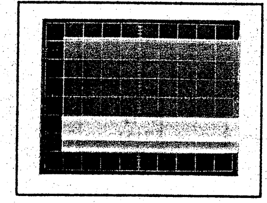
5. 50msec/DIV,1V/DIV



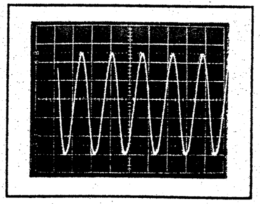
6. 50nsec/DIV,1V/DIV



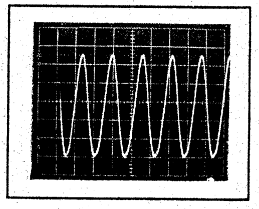
7. 10μsec/DIV,1V/DIV



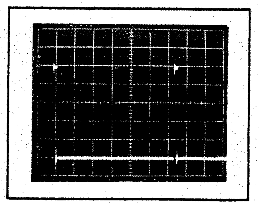
8. 50nsec/DIV,1V/DIV



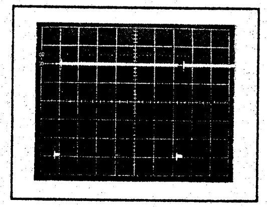
9. 50nsec/DIV,1V/DIV



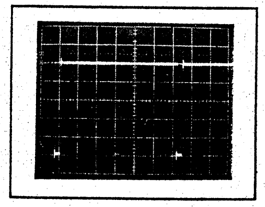
10. 10μsec/DIV,1V/DIV



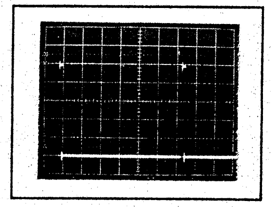
11. 10μsec/DIV,1V/DIV



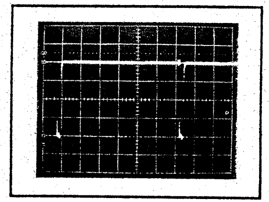
12. 10μsec/DIV,1V/DIV



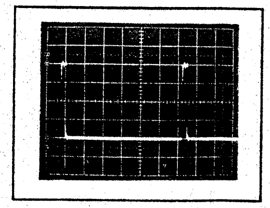
13. 10μsec/DIV,1V/DIV



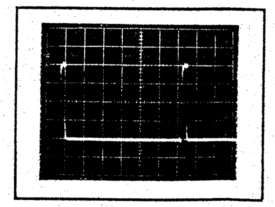
14. 10μsec/DIV,1V/DIV



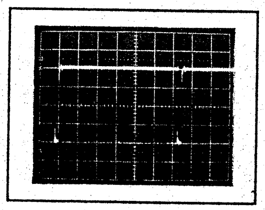
15. 10μsec/DIV,1V/DIV



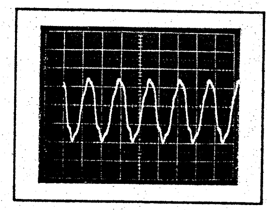
16. 10μsec/DIV,1V/DIV



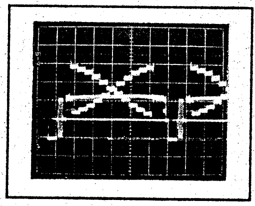
17. 10μsec/DIV,1V/DIV



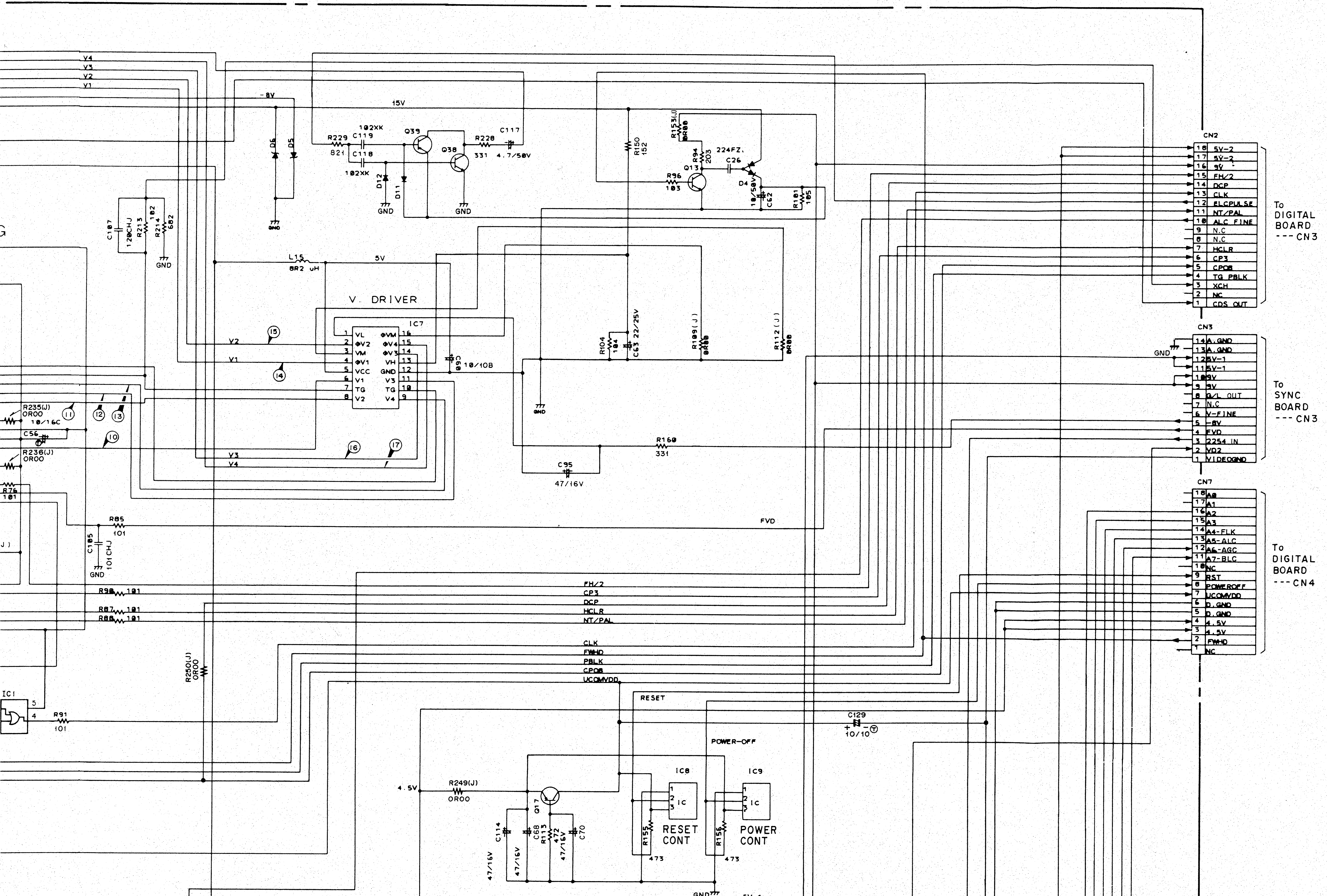
18. 50nsec/DIV,2V/DIV



19. 10μsec/DIV,0.5V/DIV

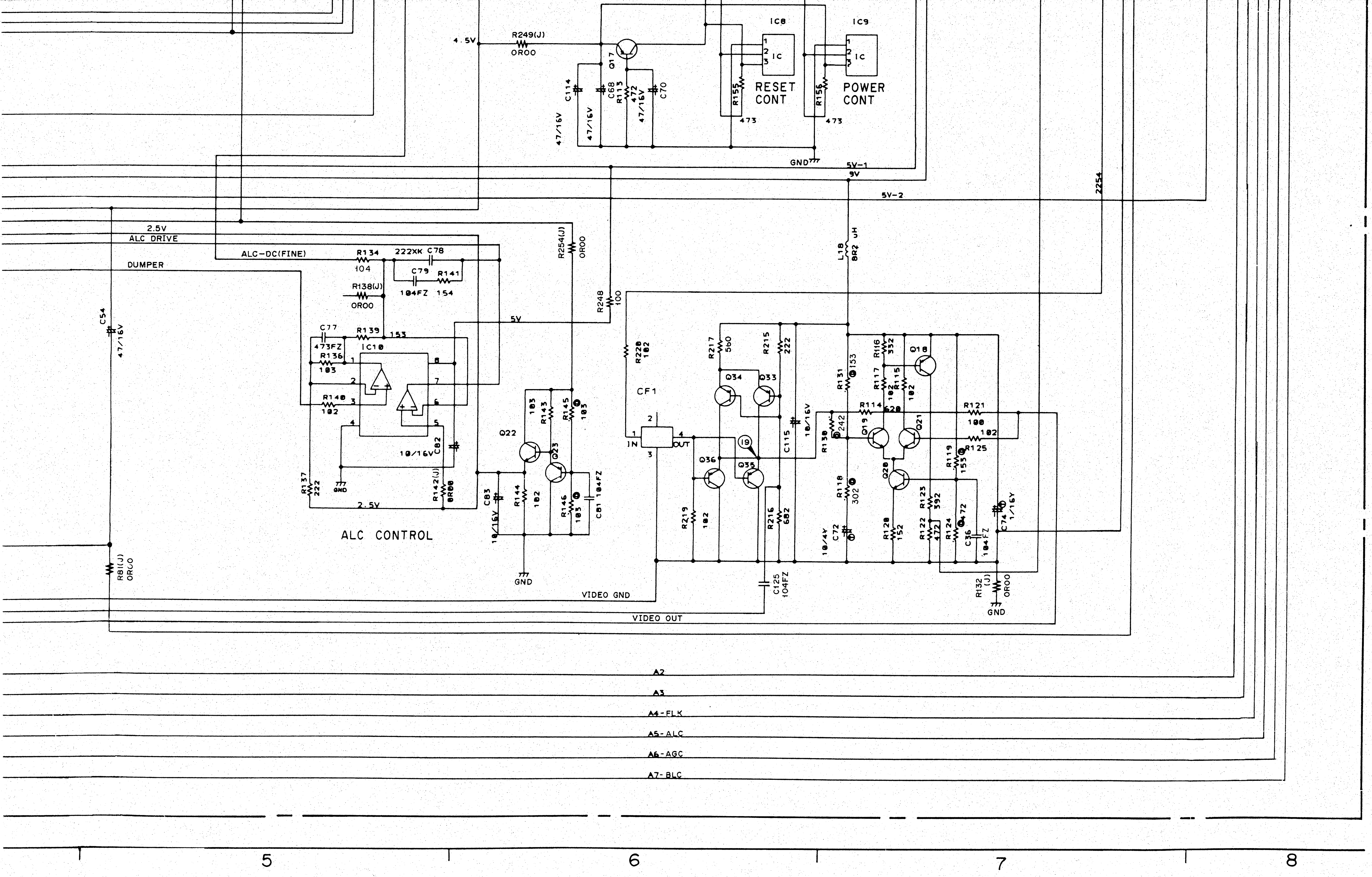


OF DRIVE BOARD

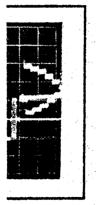

V4
V3
V2
V1
-8V
15V
D6
D5
GND
102XK
R229
821
C119
C118
102XK
Q39
Q38
R228
331
C117
4.7/50V
D12
D11
GND
R150
152
R153(J)
0R00
R94
203
224FZ.
C26
Q13
R96
103
D4
10/50V
C62
R101
105
C107
120CHJ
R213
102
R214
682
GND
L15
8R2 uH
5V
V. DRIVER
IC7
VL
ΦV2
VM
ΦV1
VCC
V1
TG
V2
ΦVM
ΦV4
ΦV3
VH
GND
V3
TG
V4
C60
10/10B
R104
104
C63 22/25V
R109(J)
0R00
R112(J)
0R00
GND
⑮
⑭
R235(J)
0R00
10/16C
⑪
⑫
⑬
C56
⑩
R236(J)
0R00
R76
101
⑯
⑰
R160
331
C95
47/16V
R85
101
C105
101CHJ
GND
FVD
R90 101
R87 101
R88 101
FH/2
CP3
DCP
HCLR
NT/PAL
CLK
FWHD
PBLK
CPOB
UCOMVDD
R250(J)
0R00
IC1
R91
101
RESET
C129
10/10
POWER-OFF
4.5V
R249(J)
0R00
Q17
C114
47/16V
C68
47/16V
R113
472
47/16V
C70
IC8
IC
RESET CONT
R155
473
IC9
IC
POWER CONT
R156
473
GND
CN2
16 5V-2
17 5V-2
16 9V
15 FH/2
14 DCP
13 CLK
12 ELCPULSE
11 NT/PAL
10 ALC FINE
9 N.C
8 N.C
7 HCLR
6 CP3
5 CPOB
4 TG PBLK
3 XCH
2 NC
1 CDS OUT
To DIGITAL BOARD ---CN3
CN3
14 A.GND
13 A.GND
12 5V-1
11 5V-1
10 9V
9 9V
8 G/L OUT
7 N.C
6 V-FINE
5 -8V
4 FVD
3 2254 IN
2 VD2
1 VIDEOGND
To SYNC BOARD ---CN3
CN7
18 A0
17 A1
16 A2
15 A3
14 A4-FLK
13 A5-ALC
12 A6-AGC
11 A7-BLC
10 NC
9 RST
8 POWEROFF
7 UCOMVDD
6 D.GND
5 D.GND
4 4.5V
3 4.5V
2 FWHD
1 NC
To DIGITAL BOARD ---CN4

DRIVE BOARD

IC1	C4
IC2	D2
IC3	C2
IC6	D4
IC7	D5
IC8	C6
IC9	C7
IC10	B5
IC20	D3
IC21	D3
IC22	A3
Q1	D2
Q2	D2
Q3	D2
Q4	D2
Q6	C2
Q13	E6
Q17	C6
Q18	B7
Q19	B7
Q20	B7
Q21	B7
Q22	B6
Q23	B6
Q24	D2
Q33	B6
Q34	B6
Q35	B6
Q36	B6
Q38	E6
Q39	E6
D1	D4
D4	E7
D5	E5
D6	E5
D7	C3
D8	C4
D11	E5
D12	E5


IC8
IC9
RESET CONT
POWER CONT
R155
R156
473
473
4.5V
R249(J)
OROO
Q17
C114
C68
R113
472
C70
47/16V
47/16V
47/16V
GND
5V-1
9V
5V-2
2254
2.5V
ALC DRIVE
ALC-DC(FINE)
DUMPER
R134
104
222XK C78
C79
R141
104FZ 154
R138(J)
OROO
R254(J)
OROO
R248
100
5V
C77
473FZ
R139
153
IC10
R136
103
R140
102
R137
222
GND
2.5V
C82
10/16V
R142(J)
0R00
C54
47/16V
R81(J)
ORO0
ALC CONTROL
Q22
Q23
103
R143
R145
103
R144
102
R146
103
C81 104FZ
C83
10/16V
GND
L18
8R2 uH
R220
102
CF1
IN
OUT
R217
560
R215
222
Q34
Q33
Q36
Q35
19
R219
102
R216
682
C115
10/16V
C125
104FZ
R131
153
R130
242
R118
302
C72
10/4Y
R116
332
R117
102
R115
102
Q18
R114
620
Q19
Q21
Q20
R121
100
102
R125
R119
153
R120
152
R123
392
R122
472
R124
472
C36
104FZ
C74
1/16Y
R132(J)
OROO
GND
VIDEO GND
VIDEO OUT
A2
A3
A4-FLK
A5-ALC
A6-AGC
A7-BLC
5
6
7
8

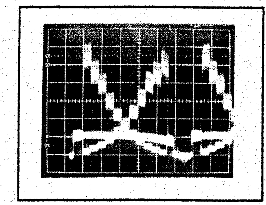
.5V/DIV



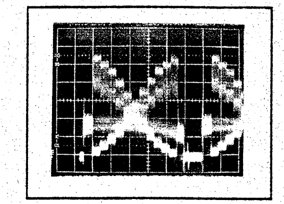
DIGITAL BOARD

IC1	D2
IC2	C1
IC3	C1
IC6	C2
IC7	B2
IC8	E3
IC9	D3
IC10	B3
IC12	E5
IC13	A5
Q8	D1
Q9	D1
Q10	D2
Q11	D2
Q14	E5
Q15	E5
Q16	D5
Q17	D4
Q18	C4
Q19	C5
Q20	C5
Q21	C5
Q26	E2
Q27	B2
D2	D5
D3	D5
D4	D5

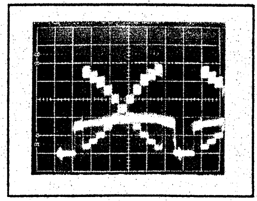
1. 10µsec/DIV,0.1V/DIV



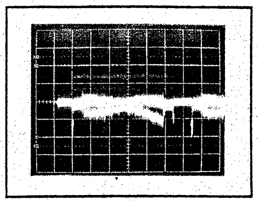
2. 10µsec/DIV,0.2V/DIV



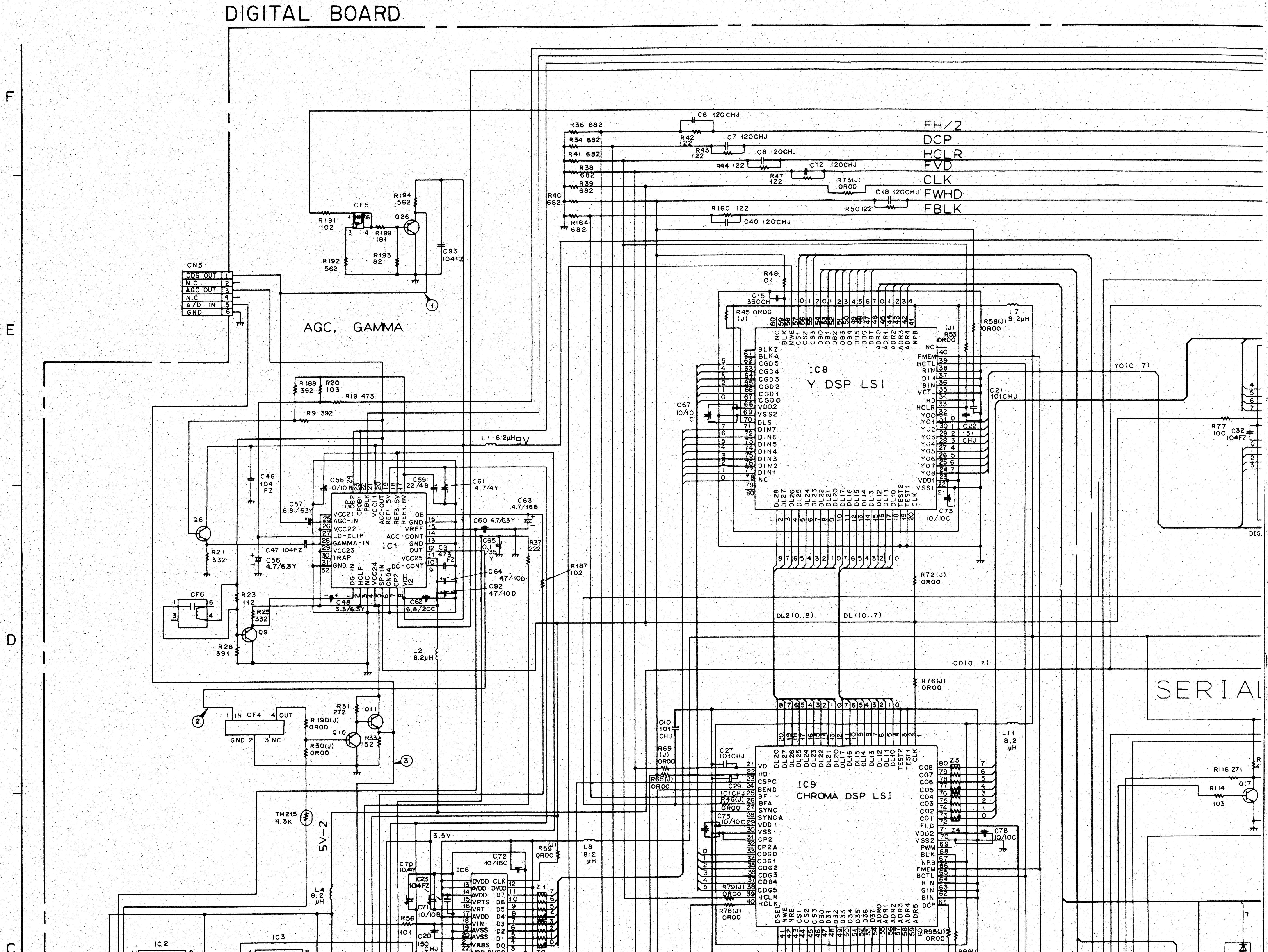
3. 10µsec/DIV,0.2V/DIV

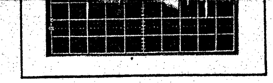


4. 10µsec/DIV,50mV/DIV

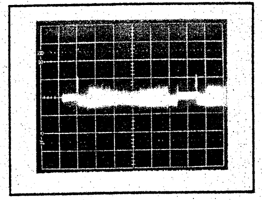


5. 10µsec/DIV,50mV/DIV

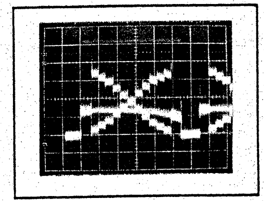




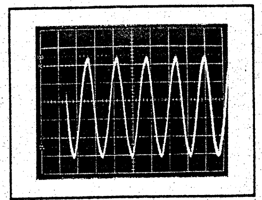
5. 10µsec/DIV,50mV/DIV



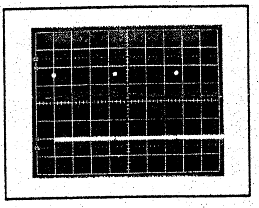
6.10µsec/DIV,50mV/DIV



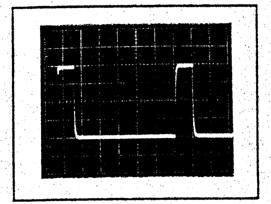
7. 10µsec/DIV,0.5V/DIV

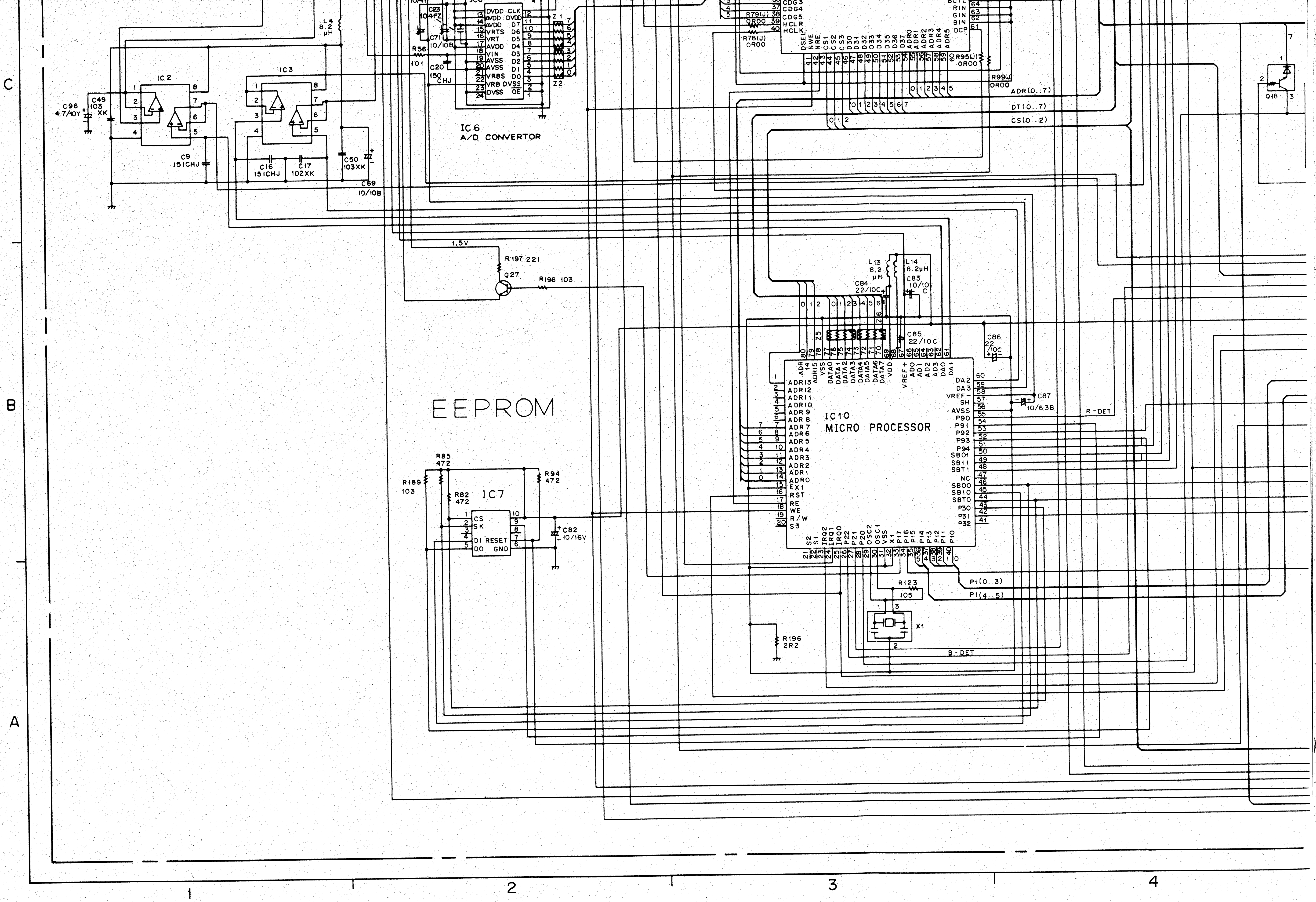


8. 50msec/DIV,1V/DIV

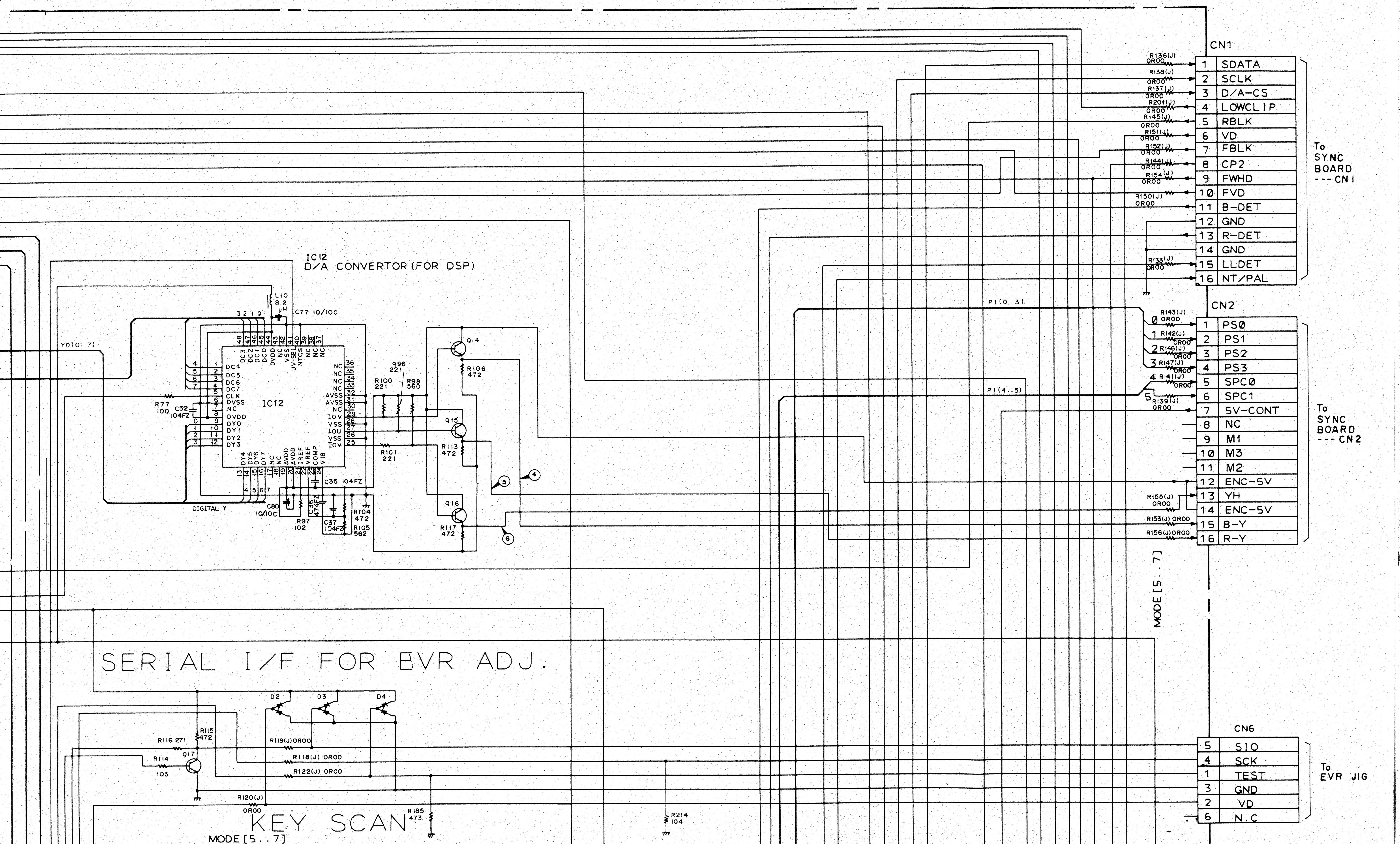


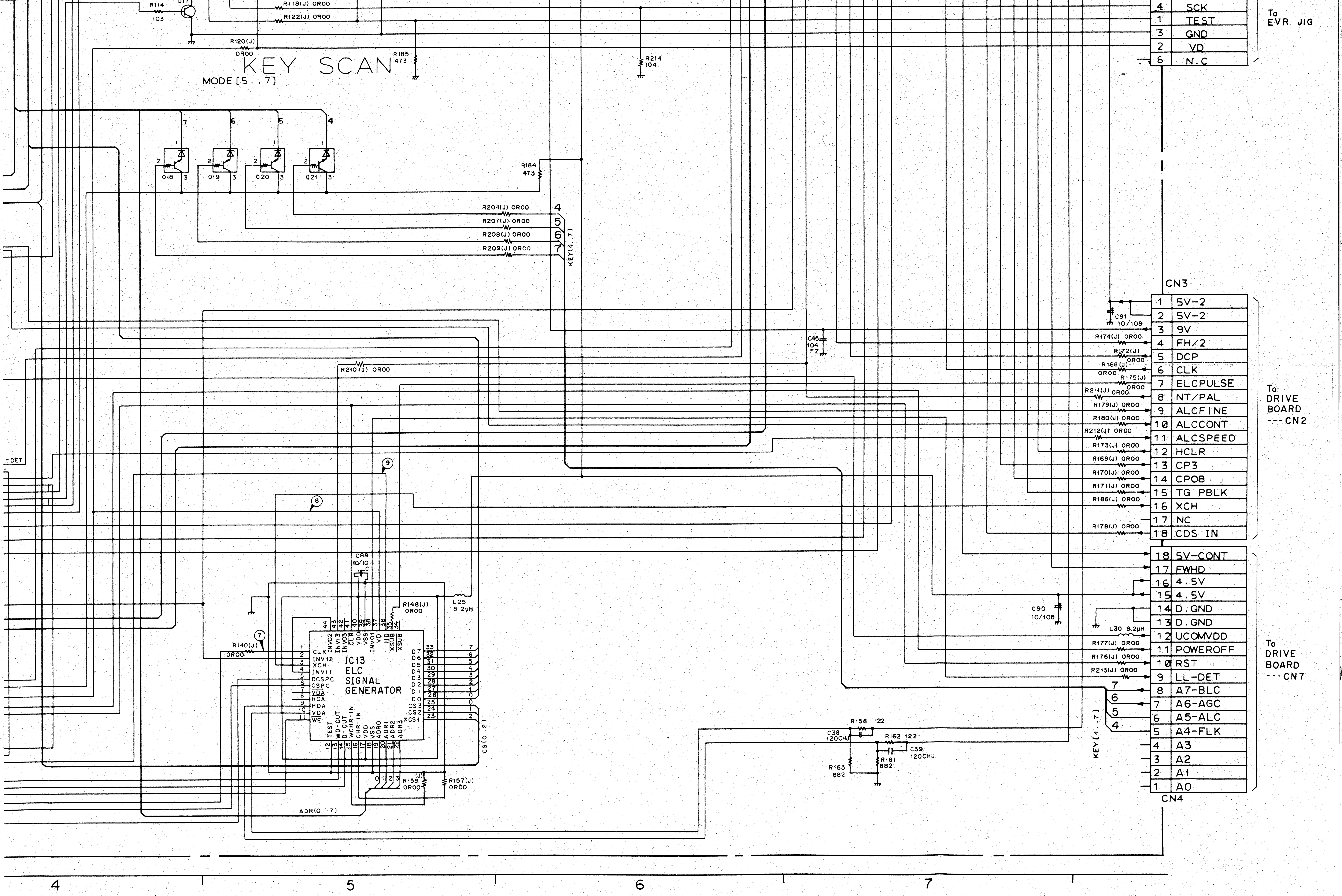
9. 10µsec/DIV,1V/DIV





EMATIC DIAGRAM OF DIGITAL BOARD


CN1
1 SDATA
2 SCLK
3 D/A-CS
4 LOWCLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B-DET
12 GND
13 R-DET
14 GND
15 LLDET
16 NT/PAL
To SYNC BOARD --- CN1
R136(J) 0R00
R138(J) 0R00
R137(J) 0R00
R201(J) 0R00
R145(J) 0R00
R151(J) 0R00
R152(J) 0R00
R144(J) 0R00
R154(J) 0R00
R150(J) 0R00
R133(J) 0R00
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPC0
6 SPC1
7 5V-CONT
8 NC
9 M1
10 M3
11 M2
12 ENC-5V
13 YH
14 ENC-5V
15 B-Y
16 R-Y
To SYNC BOARD --- CN2
P1(0..3)
P1(4..5)
R143(J) 0R00
R142(J) 0R00
R146(J) 0R00
R147(J) 0R00
R141(J) 0R00
R139(J) 0R00
R155(J) 0R00
R153(J) 0R00
R156(J) 0R00
MODE [5..7]
IC12
D/A CONVERTOR (FOR DSP)
L10 8.2 µH
C77 10/10C
Y0(0..7)
DC4 DC5 DC6 DC7 CLK DVSS NC DVDD DY0 DY1 DY2 DY3
DC3 DC2 DC1 DC0 DVDD NC VSS UV-SEL NTCS NC NC NC
NC NC NC NC AVSS AVSS NC IOV VSS IOU VSS IOV
DY4 DY5 DY6 DY7 NC NC AVDD AVDD IREF VREF COMP V18
R77 100
C32 104FZ
C35 104FZ
C80 10/10C
C36 474FZ
C37 104FZ
R97 102
R104 472
R105 562
DIGITAL Y
R96 221
R100 221
R98 560
R101 221
Q14
Q15
Q16
R106 472
R113 472
R117 472
④ ⑤ ⑥
SERIAL I/F FOR EVR ADJ.
D2 D3 D4
R115 472
R116 271
R114 103
Q17
R119(J)0R00
R118(J) 0R00
R122(J) 0R00
R120(J) 0R00
R185 473
R214 104
KEY SCAN
MODE [5..7]
CN6
5 SIO
4 SCK
1 TEST
3 GND
2 VD
6 N.C
To EVR JIG


R114
103
Q17
R118(J) OR00
R122(J) OR00
R120(J)
OR00
R185
473
R214
104
KEY SCAN
MODE [5..7]
7
6
5
4
Q18
Q19
Q20
Q21
1
2
3
R184
473
R204(J) OR00
R207(J) OR00
R208(J) OR00
R209(J) OR00
KEY(4..7)
4 SCK
1 TEST
3 GND
2 VD
6 N.C
To EVR JIG
CN3
1 5V-2
2 5V-2
3 9V
4 FH/2
5 DCP
6 CLK
7 ELCPULSE
8 NT/PAL
9 ALCFINE
10 ALCCONT
11 ALCSPEED
12 HCLR
13 CP3
14 CPOB
15 TG PBLK
16 XCH
17 NC
18 CDS IN
To DRIVE BOARD ---CN2
C91
10/108
C45
104
FZ
R174(J) OR00
R172(J) OR00
R168(J) OR00
R175(J) OR00
R211(J) OR00
R179(J) OR00
R180(J) OR00
R212(J) OR00
R173(J) OR00
R169(J) OR00
R170(J) OR00
R171(J) OR00
R186(J) OR00
R178(J) OR00
R210(J) OR00
- DET
9
8
7
C88
10/10
R148(J)
OR00
L25
8.2μH
R140(J)
OR00
IC13
ELC
SIGNAL
GENERATOR
CLK
INV12
XCH
INV11
DCSPC
CSPC
VDA
HDA
HDA
VDA
WE
INVO2
INV13
INVO3
CLR
VDD
VSS
INVO1
VD
HD
XSUB
XSUB
D7
D6
D5
D4
D3
D2
D1
D0
CS3
CS2
XCS1
TEST
WD-OUT
D-OUT
WCHR-IN
CHR-IN
VDD
VSS
ADR0
ADR1
ADR2
ADR3
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33
34 35 36 37 38 39 40 41 42 43 44
CS(0..2)
ADR(0..7)
0 1 2 3
R159(J)
OR00
R157(J)
OR00
C90
10/108
L30 8.2μH
R177(J) OR00
R176(J) OR00
R213(J) OR00
18 5V-CONT
17 FWHD
16 4.5V
15 4.5V
14 D.GND
13 D.GND
12 UCOMVDD
11 POWEROFF
10 RST
9 LL-DET
8 A7-BLC
7 A6-AGC
6 A5-ALC
5 A4-FLK
4 A3
3 A2
2 A1
1 A0
CN4
To DRIVE BOARD ---CN7
KEY[4..7]
R158 122
C38
120CHJ
R162 122
C39
120CHJ
R161
682
R163
682
4
5
6
7

CONDUCTOR VIEW OF DIGITAL BOARD

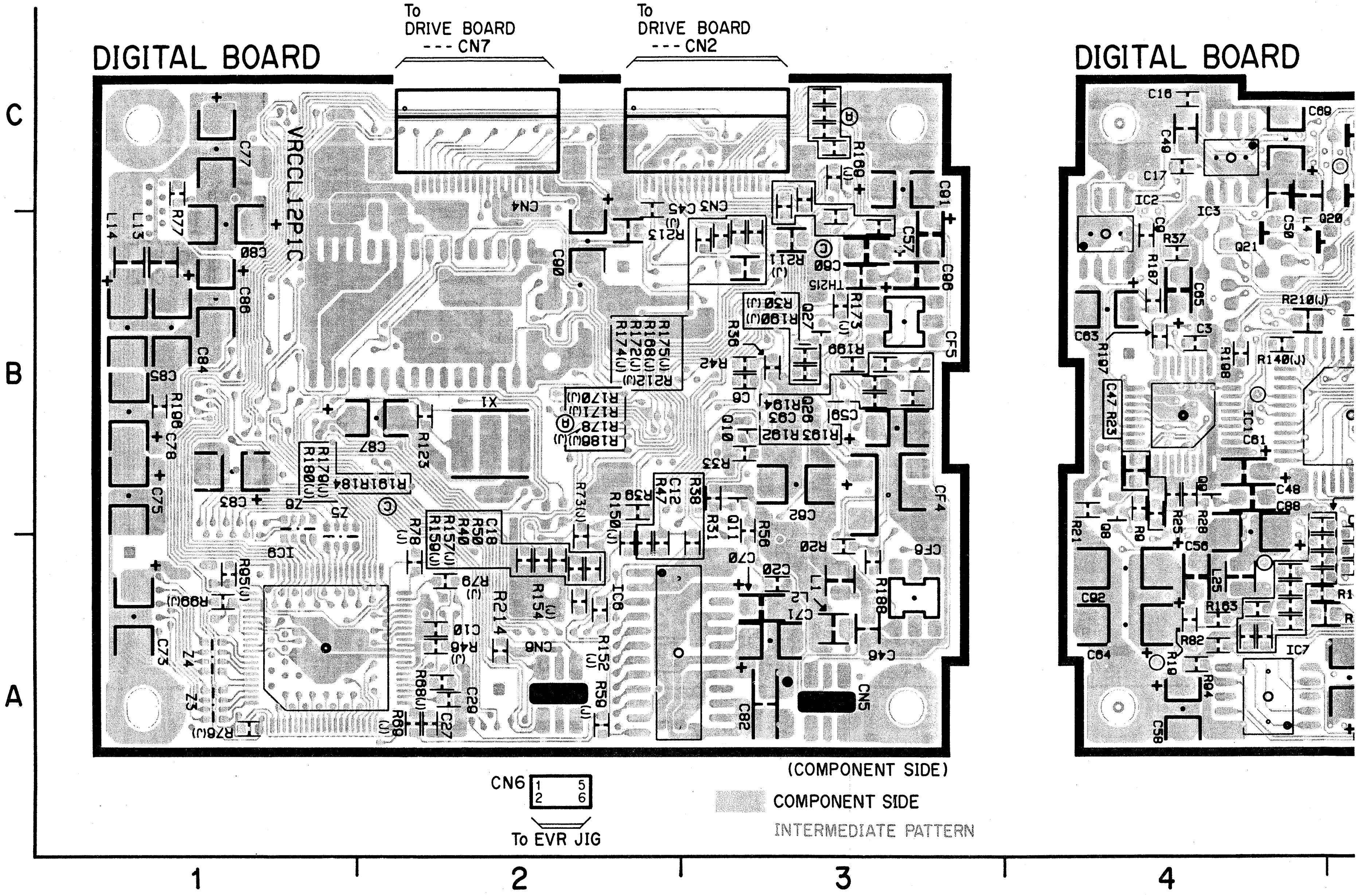
	IC8	IC9	IC10
Pin 1	0.3	2.1	2.4
2	0.8	0	2.4
3	2.8	0	2.4
4	1.0	1.8	2.4
5	0.9	1.5	2.4
6	0.8	1.5	2.8
7	1.2	0	2.7
8	1.5	2.5	3.8
9	1.2	3.4	2.4
10	0.2	0	3.6
11	1.2	0.2	3.1
12	2.1	1.2	3.1
13	1.8	1.4	3.0
14	1.3	1.1	2.8
15	1.4	1.2	0.0
16	1.4	1.8	4.3
17	1.8	2.1	3.9
18	0	3.0	4.1
19	0	0	3.4
20	2.1	0.3	1.1
21	0	0.1	3.1
22	4.3	0.5	3.1
23	0.4	2.1	4.3
24	2.4	0	0.0
25	1.3	0.8	0.1
26	1.5	1.0	4.8
27	1.7	0	2.1
28	1.6	0	4.3
29	1.5	4.3	1.7
30	1.5	0	1.9
31	1.6	0	0.0
32	0.4	0	0.0
33	0	4.3	0
34	0	4.3	0
35	0	4.1	4.3
36	0	4.2	0
37	0	4.2	4.3
38	0	4.2	4.3
39	0	0.4	4.3
40	0	0	0

	IC8	IC9	IC10
Pin 41	4.3	0	0
42	3.7	4.2	0
43	3.0	4.0	4.2
44	3.1	2.8	4.3
45	3.0	2.8	4.3
46	2.7	2.8	4.3
47	0.5	1.6	0
48	0.6	0.6	0
49	0.7	1.0	4.3
50	0.8	1.0	0
51	1.0	0.1	0
52	1.1	0.4	4.3
53	0.9	0.2	4.3
54	1.8	0.4	0
55	2.4	2.7	3.2
56	2.8	2.9	0
57	2.4	3.2	0
58	4.1	3.3	1.6
59	0.5	3.8	1.6
60	0	2.8	2.3
61	0.6	0	1.7
62	0	0	2.7
63	4.2	0	0
64	4.2	0	0
65	4.1	0	0
66	4.1	0	0
67	4.3	4.3	3.7
68	4.3	0.5	4.3
69	4.3	0	4.3
70	0	0	0.5
71	4.3	4.3	0.7
72	0	2.1	0.8
73	1.8	1.2	0.9
74	1.5	1.3	1.0
75	2.2	1.4	1.2
76	1.5	1.5	1.0
77	1.6	1.5	1.8
78	1.8	1.5	0
79	0	0	2.4
80	0	1.4	2.3

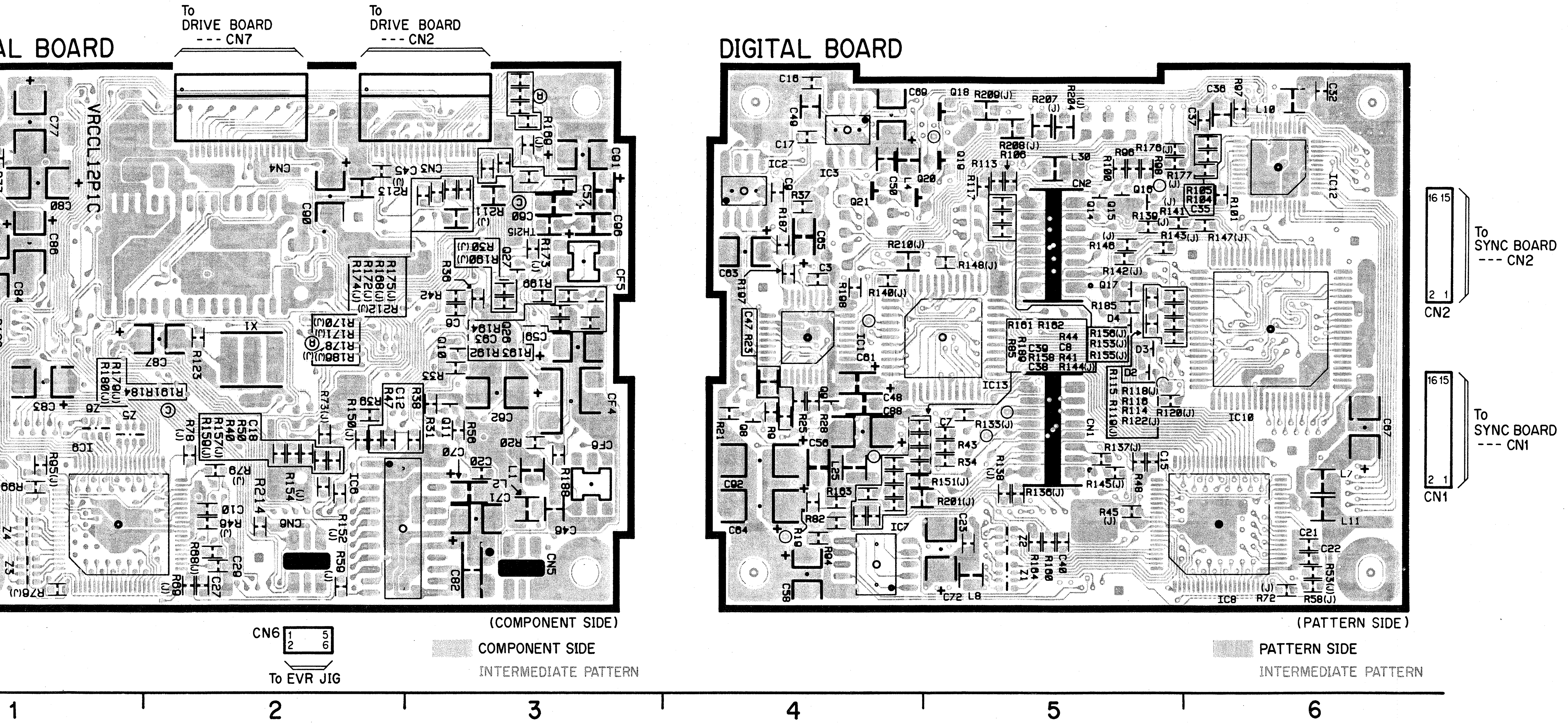
	IC2	IC3	IC7	IC15
Pin 1	1.7	2.2	4.2	0
2	1.7	2.2	0	0.5
3	1.7	2.2	0	0
4	0	0	4.3	2.1
5	1.7	3.1	4.3	4.4
6	1.7	3.1	0	
7	1.7	3.1	0	
8	4.8	4.8	0	
9			4.3	
10			4.3	

	B	C	E
Q8	1.9	8.7	1.36
9	0.5	0	1.1
10	1.9	0	2.5
11	2.5	4.8	1.8
14	4.2	4.8	3.6
15	4.5	4.7	3.9
16	4.2	4.8	0
17	0	4.4	0
18	0	4.3	0
19	0	4.3	3.8
20	0	4.3	2.4
21	0	4.3	3.6
26	1.7	0	2.3
27	0	3.1	1.6

	IC1	IC6	IC12	IC13
Pin 1	1.9	0	1.4	0
2	4.8	0	0	0
3	0	0	0	4.1
4	4.8	1.6	1.4	0
5	2.1	1.6	2.1	2.1
6	0	1.7	0	2.0
7	0	2.2	0	4.2
8	8.7	1.9	4.8	3.7
9	3.1	0	1.3	0.5
10	4.8	0	1.3	0.1
11	2.0	4.3	1.3	4.1
12	0	2.1	1.3	0
13	2.5	4.3	1.3	0
14	1.7	4.3	0	0
15	0	4.3	1.9	0
16	1.9	4.3	0	0
17	3.7	3.7	0	4.3
18	1.6	4.3	0	0
19	1.9	1.8	0.7	2.8
20	8.7	0	0	3.0
21	0.9	0	2.7	3.1
22	0	0	2.6	3.0
23	0	1.6	2.8	2.4
24	4.8	0	1.5	2.4
25	1.9		3.8	2.4
26	4.8		0	1.8
27	1.9		4.2	1.0
28	0		0	1.1
29	0		4.2	1.0
30	4.8		0	0.8
31	1.9		0	0.8
32	0		0	0.5
33			0	0.5
34			0	0
35			0	4.3
36			0	0.5
37			0	0.1
38			0	0
39			0	0
40			0	4.3
41			0	4.3
42			0	4.3
43			0	0
44			4.8	4.3
45			0	
46			1.6	
47			1.8	
48			2.0	


DIGITAL BOARD
To DRIVE BOARD --- CN7
To DRIVE BOARD --- CN2
DIGITAL BOARD
VRCCL12P1C
CN4
CN3
CN5
CN8
X1
IC9
IC6
IC1
IC2
IC3
IC7
CN6
1 5
2 6
To EVR JIG
(COMPONENT SIDE)
COMPONENT SIDE
INTERMEDIATE PATTERN
C
B
A
1
2
3
4

CONDUCTOR VIEW OF DIGITAL BOARD


AL BOARD
To DRIVE BOARD --- CN7
To DRIVE BOARD --- CN2
VRCCL12P1C
CN6
To EVR JIG
(COMPONENT SIDE)
COMPONENT SIDE
INTERMEDIATE PATTERN
DIGITAL BOARD
To SYNC BOARD --- CN2
To SYNC BOARD --- CN1
CN2
CN1
(PATTERN SIDE)
PATTERN SIDE
INTERMEDIATE PATTERN
1
2
3
4
5
6

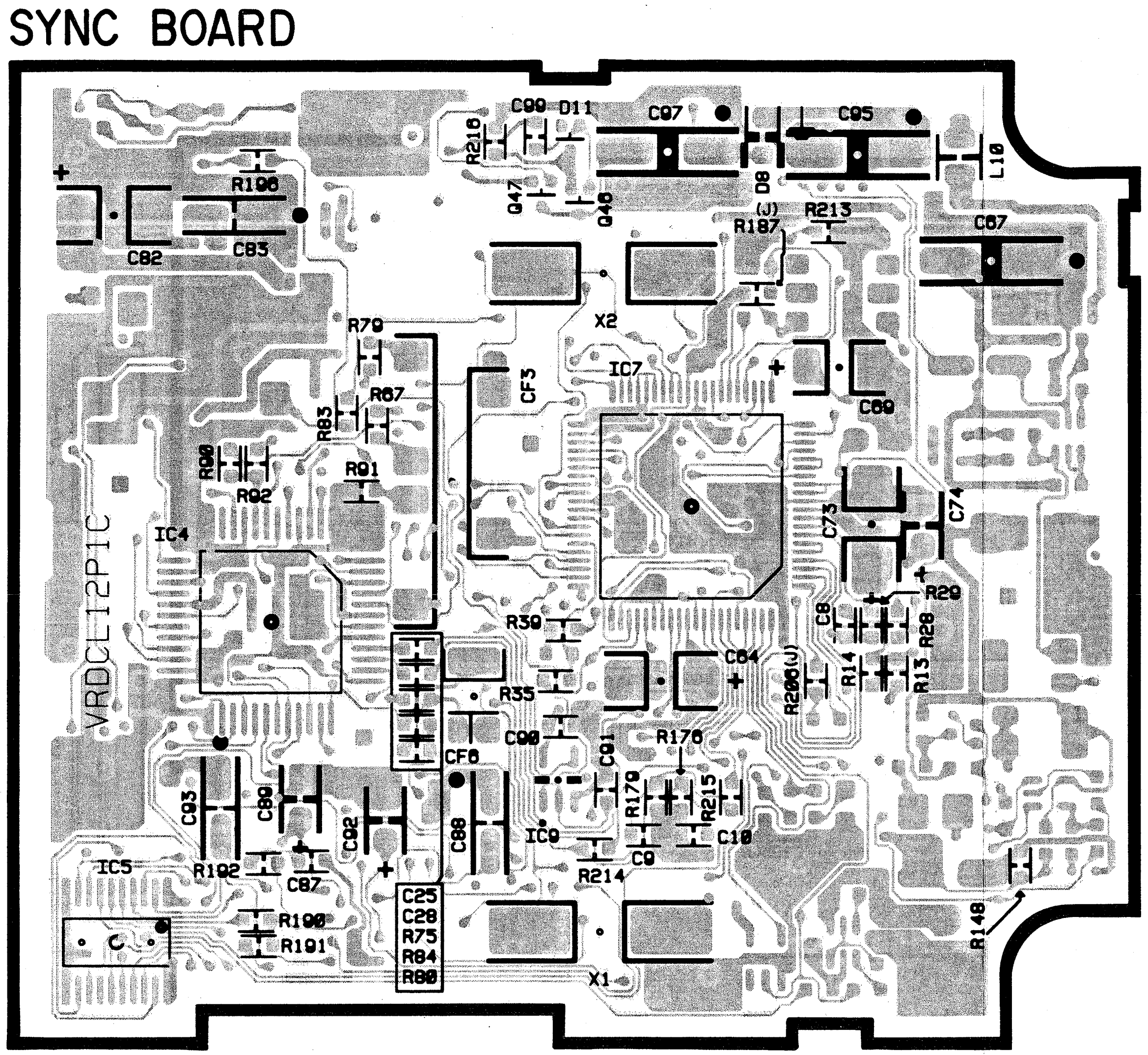
DIGITAL BOARD

IC1	B4
IC2	B4
IC3	C4
IC6	A2
IC7	A4
IC8	A6
IC9	A1
IC10	B6
IC12	B6
IC13	B5
Q8	B4
Q9	B4
Q10	B3
Q11	B3
Q14	B5
Q15	B5
Q16	B5
Q17	B5
Q18	C5
Q19	C5
Q20	B4
Q21	B4
Q26	B3
Q27	B3
D2	B5
D3	B5
D4	B5

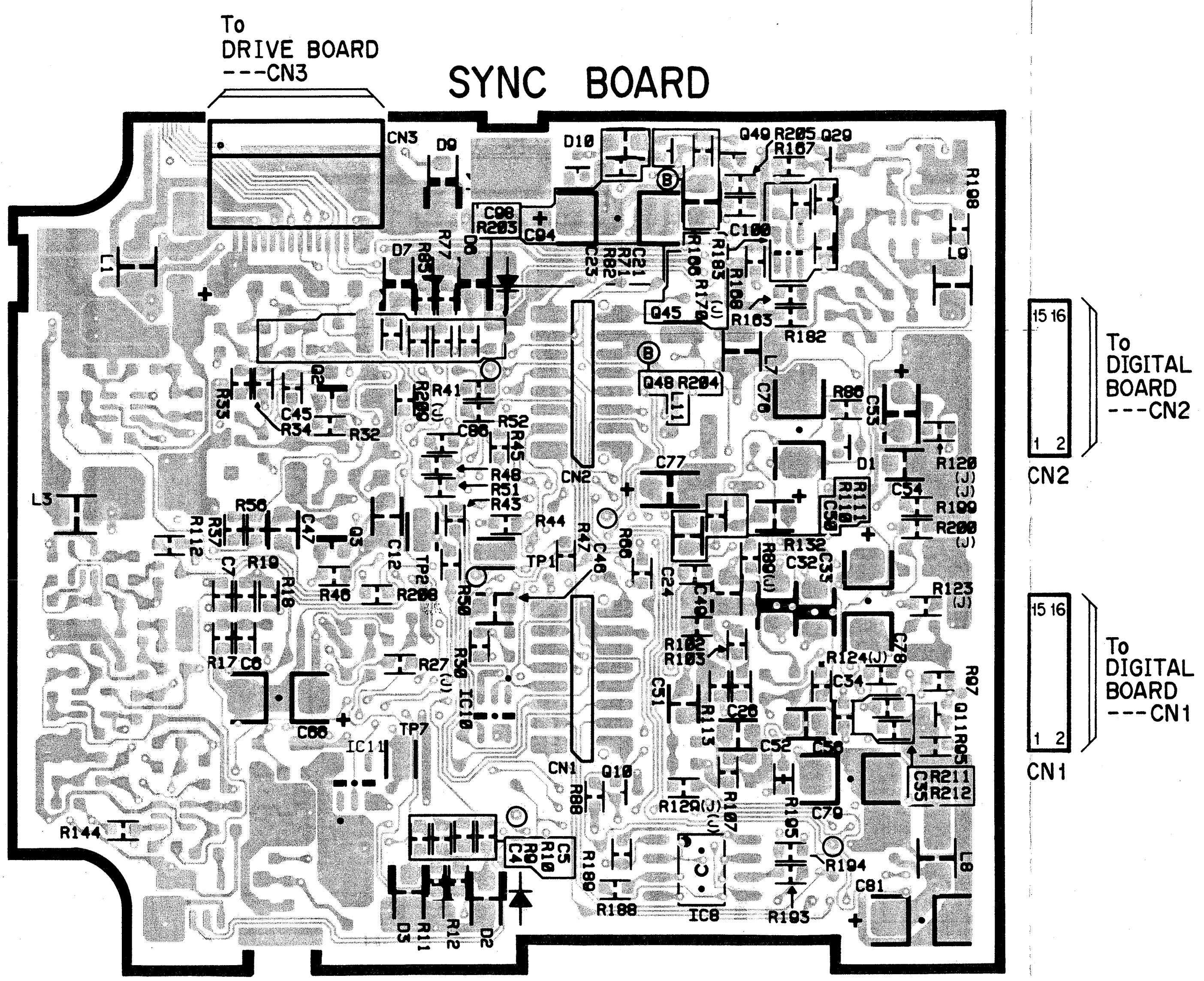
CONDUCTOR VIEW OF SYNC BOARD

SYNC BOARD

IC4	B1
IC5	A1
IC7	B2
IC8	A5
IC9	A2
IC10	B4
IC11	A4
Q2	B4
Q3	B4
Q10	A5
Q11	B6
Q29	C5
Q45	C5
Q46	C2
Q47	C2
Q48	C5
Q49	C5
D1	B5
D2	A4
D3	A4
D6	C4
D7	C4
D8	C2
D9	C4
D10	C5
D11	C2


C
B
A
1
2
3
4
5
6
SYNC BOARD
C99 D11
C97
C95
R216
L10
R196
Q47
Q46
D8
(J)
R187
R213
C87
C82
C83
X2
R79
CF3
IC7
C69
R67
R83
R90
R92
R91
VRDCL12P1C
IC4
C73
C74
R20
R39
R28
C8
R14
R13
C64
R200(J)
R35
C90
CF6
C91
R176
R170
R215
C10
C93
C89
C92
C88
IC9
C9
R214
IC5
R192
C87
C25
C28
R75
R84
R80
R190
R191
X1
R148

(COMPONENT SIDE)


To
DRIVE BOARD
---CN3
SYNC BOARD
CN3
D9
D10
Q49 R205 Q29
R167
R198
C98
R203
C94
C23
D7
R65
R77
D6
C21
R71
R82
R106
R170
R183
R169
C100
(J)
L1
Q45
R163
R182
R33
Q2
R41
C45
R34
R32
C86
R52
R45
Q48 R204
L11
C76
R86
C53
D1
R120
(J)
R199
R200
(J)
L3
R56
R57
R112
C7
R19
C4
Q3
C12
TP2
R48
R51
R43
R44
TP1
CN2
R47
C40
R66
C77
C54
R111
R110
C50
R89
R132
C32
C33
R123
(J)
R18
R46
R208
R50
C24
R102
R103
C1
R124(J)
C78
R17 C8
R27
(J)
R39
IC10
C51
C34
R97
Q11
R65
C66
TP7
IC11
R113
C20
C52
C56
C35
R211
R212
CN1
Q10
R88
R120(J)
R107
(J)
R105
C79
R144
C5
R10
R9
C4
R180
R194
C81
L8
D5
R11
R12
D2
R188
IC8
R193
15 16
1 2
To
DIGITAL
BOARD
---CN2
CN2
15 16
1 2
To
DIGITAL
BOARD
---CN1
CN1

(PATTERN SIDE)

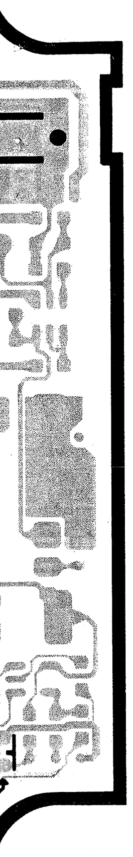
▨ COMPONENT SIDE

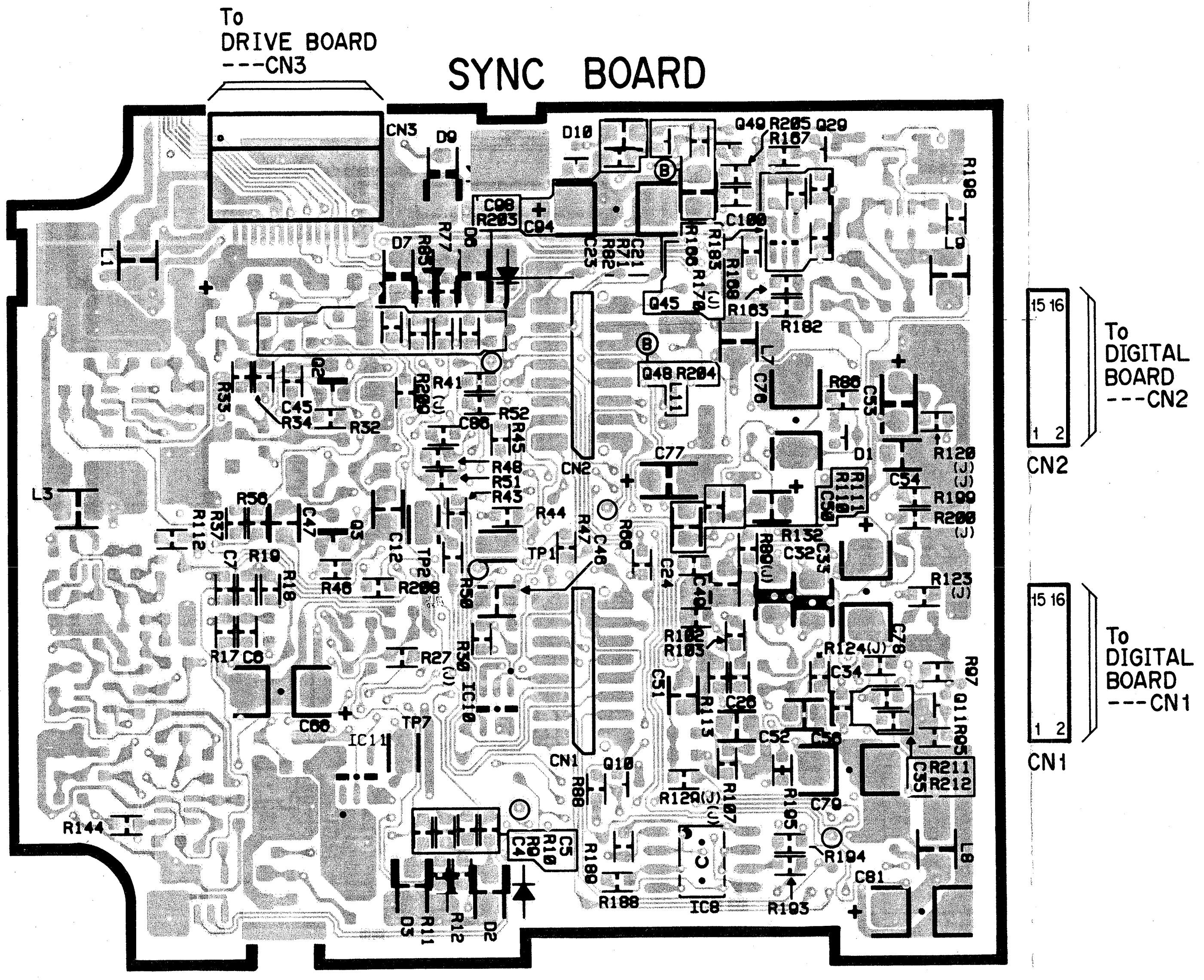
INTERMEDIATE PATTERN

▨ PATTERN SIDE

INTERMEDIATE PATTERN

UCTOR VIEW OF SYNC BOARD




To
DRIVE BOARD
---CN3
SYNC BOARD
CN3
D9
D10
Q49 R205 Q29
R167
C98
R203
C94
C23
R82
R71
C21
D7
R83
R77
D8
R160
R170
R183
R168
C100
R198
L9
L1
Q45
R163
R182
Q48 R204
L11
C76
R86
C53
R35
Q2
C45
R34
R32
R41
R209
C86
R52
R45
R48
R51
R43
C77
D1
R111
R110
C59
R120
(J)
C54
R199
R200
(J)
L3
R112
R37
R56
C47
R19
R18
C7
Q3
C12
TP2
R46
R208
R44
R47
C46
TP1
CN2
R60
R132
C32
C33
R80(J)
C24
R123
(J)
R17
C8
R27
R58
IC10
C66
IC11
TP7
R102
R103
C51
R113
C28
R124(J)
C78
C34
R97
Q11
R95
C52
C50
R211
R212
C35
CN1
Q10
R89
R128(J)
R107
R105
C79
R144
C5
R10
R9
C4
R188
R188
IC8
R193
R194
C81
L8
D3
R11
R12
D2
15 16
1 2
To
DIGITAL
BOARD
---CN2
CN2
15 16
1 2
To
DIGITAL
BOARD
---CN1
CN1

NT SIDE)

(PATTERN SIDE)

T SIDE

▨ PATTERN SIDE

IATE PATTERN

INTERMEDIATE PATTERN

3 4 5 6

	IC4		IC4
Pin 1	1.7	Pin 25	0
2	4.8	26	0
3	2.6	27	1.7
4	1.7	28	2.0
5	4.8	29	2.1
6	0	30	1.2
7	4.7	31	1.9
8	0	32	1.7
9	0	33	1.7
10	1.7	34	0
11	0	35	2.9
12	0	36	4.8
13	0	37	2.9
14	0	38	2.4
15	1.7	39	1.7
16	1.7	40	1.7
17	4.8	41	2.9
18	3.3	42	4.8
19	1.7	43	0
20	2.6	44	0.35
21	1.7	45	2.3
22	0	46	0
23	0	47	2.4
24	0	48	1.1

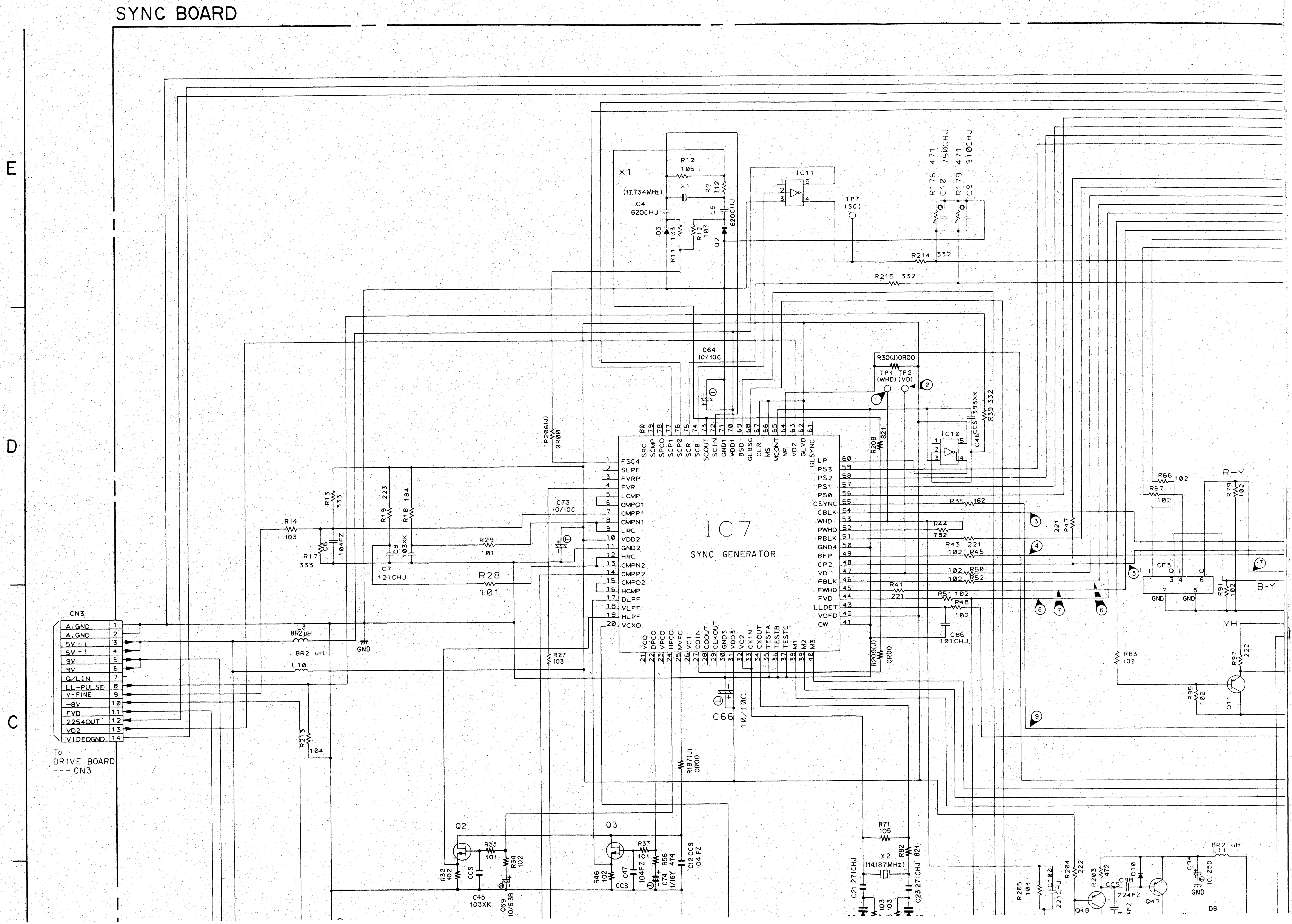
	IC7		IC7		IC7		IC7
Pin 1	0	Pin 21	0	Pin 41	0	Pin 61	0.1
2	0.5	22	0	42	4.8	62	4.8
3	0	23	0	43	0.1	63	4.7
4	1.5	24	0	44	0.1	64	0
5	4.8	25	4.8	45	0.7	65	0
6	4.8	26	0	46	1.2	66	4.8
7	0.9	27	0	47	0.1	67	4.8
8	0	28	4.8	48	0.1	68	0
9	0	29	0	49	0.1	69	4.8
10	4.8	30	0	50	0	70	4.8
11	0	31	4.8	51	1.0	71	0
12	0	32	0	52	0.7	72	2.4
13	0	33	0	53	0.7	73	2.5
14	2.3	34	4.8	54	1.1	74	1.3
15	4.8	35	0	55	4.4	75	1.3
16	4.8	36	0	56	4.3	76	0
17	0	37	0	57	4.3	77	4.3
18	0.3	38	0	58	4.3	78	0
19	4.7	39	0.0	59	4.7	79	4.8
20	0	40	0	60	4.8	80	0

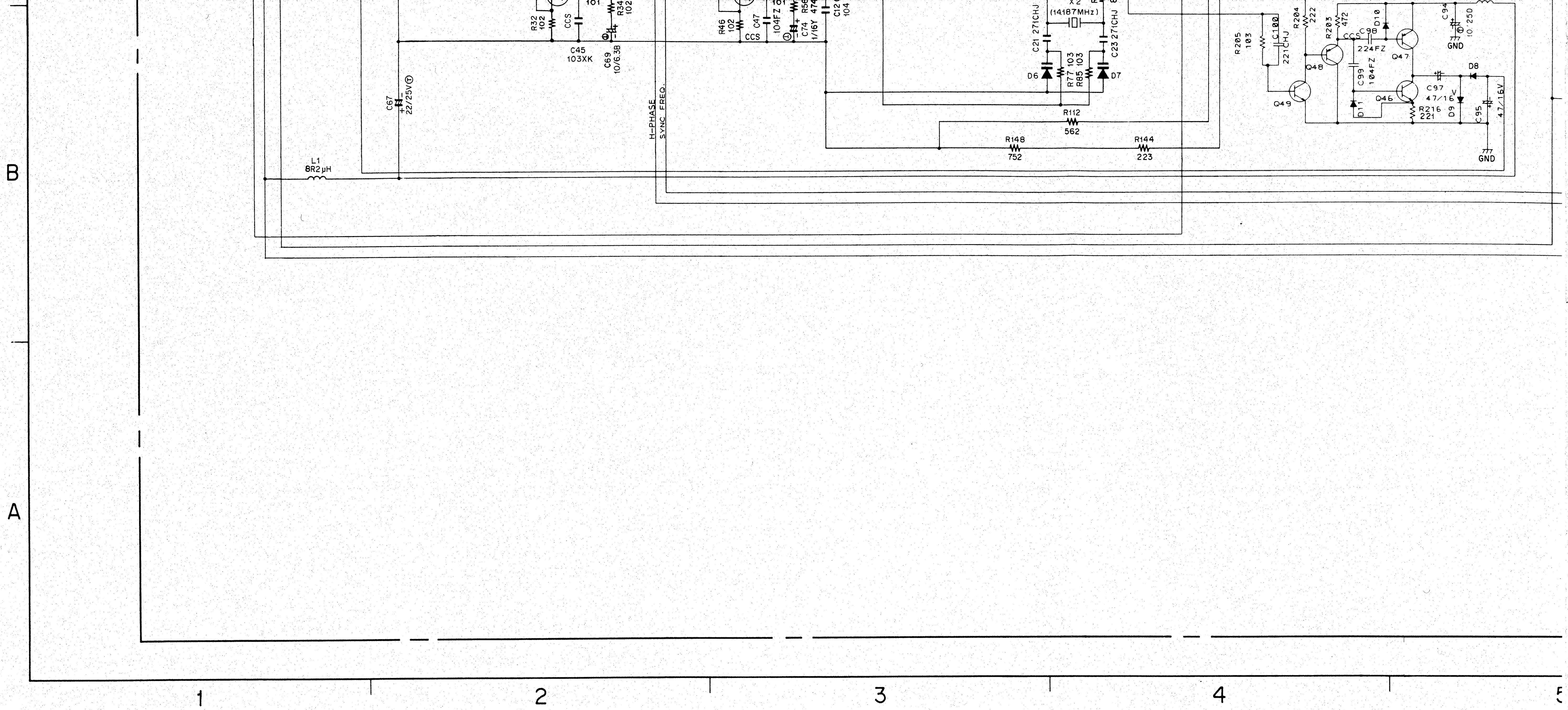
	IC5	IC8	IC9	IC10	IC11
Pin 1	0	0.1	4.4	0	0
2	0.9	1.7	4.4	0	0
3	1.4	1.7	0	0	0
4	1.7	0	4.3	4.8	5.0
5	1.7	0	4.8	4.8	0
6	2.2	1.7			
7	0.6	0.1			
8	0	4.8			
9	0				
10	3.8				
11	4.8				
12	1.6				
13	0.9				
14	1.8				
15	0				
16	3.3				
17	4.3				
18	2.4				
19	0				
20	0				

	B	C	E
Q2	4.7	4.8	4.8
3	5.2	5.5	5.5
10	1.7	0	2.3
11	0	0	2.5
29	0	8.7	1.2
46	0.8	1.7	0.3
47	9.2	1.7	8.7
48	4.1	0	2.3
49	0	4.1	0

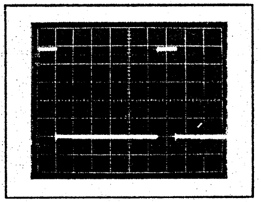
	Pin 1	2	3	4	5	6
Q45	1.1	1.7	8.7	0	3.1	3.1

SCHEMATIC DIAGRAM OF SYNC BOARD


SYNC BOARD
E
D
C
CN3
A.GND
A.GND
5V-1
5V-1
9V
9V
G/LIN
LL-PULSE
V-FINE
-8V
FVD
2254OUT
VD2
VIDEOGND
To DRIVE BOARD --- CN3
GND
L3 8R2μH
8R2 uH L10
R213 104
R14 103
R13 333
C6 104FZ
R17 333
R19 223
R18 184
C8 103XK
C7 121CHJ
R29 101
R28 101
C73 10/10C
R27 103
R206(J) 0R00
X1
(17.734MHz)
C4 620CHJ
D3
R11 103
R10 105
R9 112
R12 103
C5 620CHJ
D2
IC11
TP7 (SC)
R176 471
C10 750CHJ
R179 471
C9 910CHJ
R214 332
R215 332
C64 10/10C
R30(J)0R00
TP1 (WHD)
TP2 (VD)
①
②
C46 CCS 393XK
R39 332
IC10
R208 821
IC7
SYNC GENERATOR
1 FSC4
2 SLPF
3 FVRP
4 FVR
5 LCMP
6 CMPO1
7 CMPP1
8 CMPN1
9 LRC
10 VDD2
11 GND2
12 HRC
13 CMPN2
14 CMPP2
15 CMPO2
16 HCMP
17 DLPF
18 VLPF
19 HLPF
20 VCXO
21 VCO
22 DPCO
23 VPCO
24 HPCO
25 MVPC
26 VC1
27 COIN
28 COOUT
29 CLKOUT
30 GND3
31 VDD3
32 VC2
33 CXIN
34 CXOUT
35 TESTA
36 TESTB
37 TESTC
38 M1
39 M2
40 M3
41 CW
42 VDFD
43 LLDET
44 FVD
45 FWHD
46 FBLK
47 VD
48 CP2
49 BFP
50 GND4
51 RBLK
52 PWHD
53 WHD
54 CBLK
55 CSYNC
56 PS0
57 PS1
58 PS2
59 PS3
60 LP
61 GLSYNC
62 GLVD
63 VD2
64 NP
65 MCONT
66 MS
67 CLR
68 GLBSC
69 BSD
70 VDD1
71 GND1
72 SCIN
73 SCOUT
74 SCB
75 SCR
76 SCP0
77 SCP1
78 SPCO
79 SCMP
80 SRC
R35 162
R44 752
R43 221
R45 102
R50 102
R52 102
R41 221
R51 102
R48 102
C86 101CHJ
R209(J) 0R00
C66 10/10C
R187(J) 0R00
③
④
⑤
⑥
⑦
⑧
⑨
⑰
R47 221
R66 102
R67 102
CF3
GND
GND
R-Y
R79 102
B-Y
R91 102
YH
R83 102
R97 222
R95 102
Q11
Q2
R33 101
R34 102
R32 102
CCS
C45 103XK
C69 10/6.3B
Q3
R37 101
R46 102
C47 104FZ
CCS
R56 474
C74 1/16Y
C12 CCS 104 FZ
R71 105
X2 (14.187MHz)
R82 821
C21 271CHJ
C23 271CHJ
103
103
R205 103
C100 221CHJ
R204 222
R203 472
CCS
C98 224FZ
D10
Q48
Q47
C94 10/250
GND
8R2 uH L11
D8

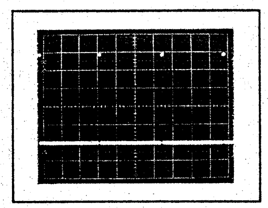

R32
102
CCS
101
R34
102
C45
103XK
C69
10/6.3B
C67
22/25V
L1
8R2µH
R46
102
CCS
C47
104FZ
C74
1/16Y
R56
474
C12
104
H-PHASE
SYNC FREQ.
X2
(14187MHz)
C21 271CHJ
C23 271CHJ
D6
R77 103
R85 103
D7
R112
562
R148
752
R144
223
R205
103
C100
221CHJ
R204
222
R203
472
CCS
C98
224FZ
D10
Q48
Q47
C94
10/25V
GND
C99
104FZ
Q49
Q46
C97
47/16V
D8
D11
R216
221
D9
C95
47/16V
GND
B
A
1
2
3
4
5

1. 10µsec/DIV,1V/DIV

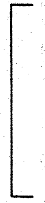


3.

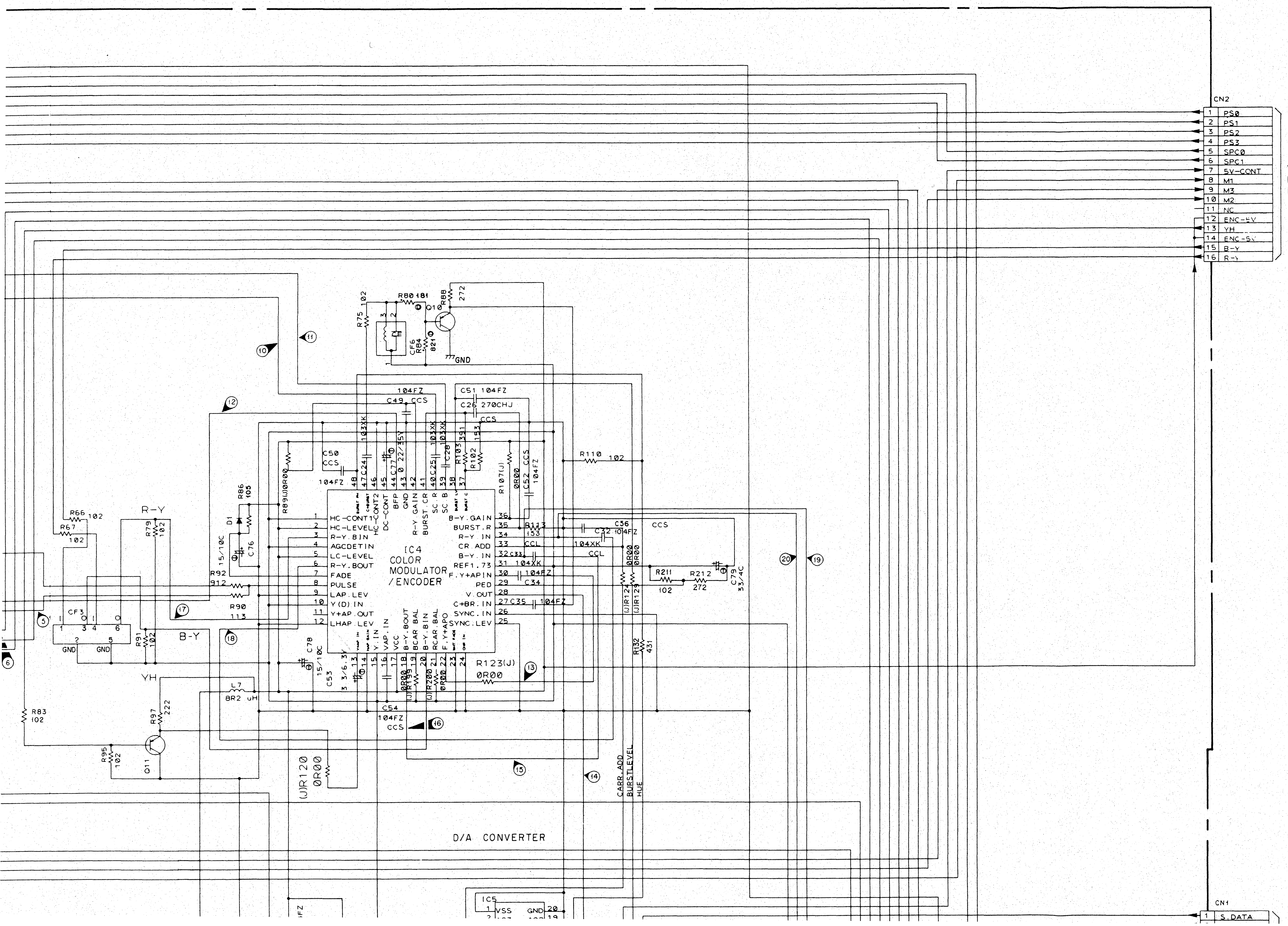
2. 5msec/DIV,1V/DIV



4.

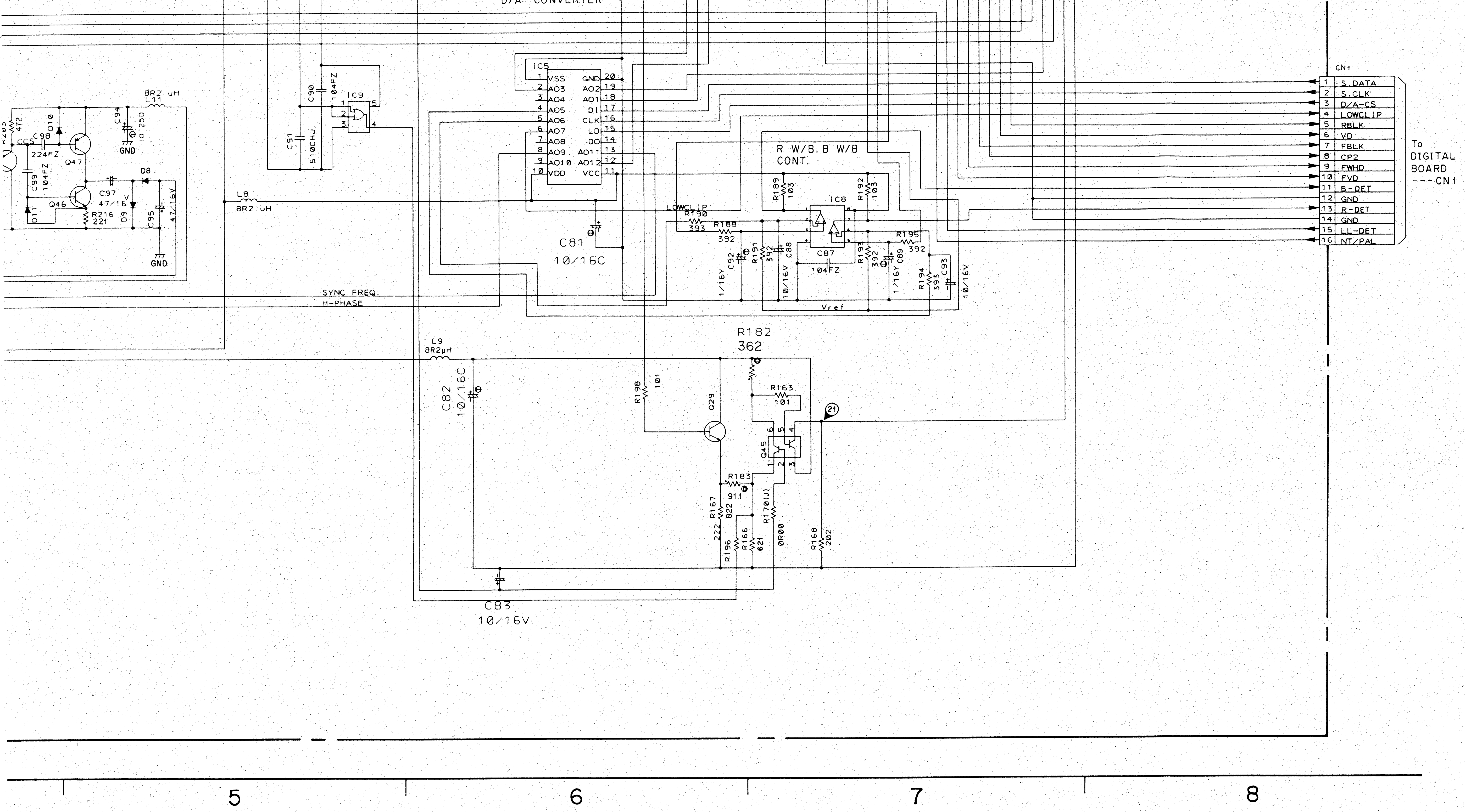


SYNC BOARD

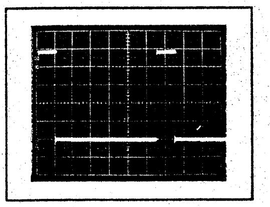

CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPC0
6 SPC1
7 5V-CONT
8 M1
9 M3
10 M2
11 NC
12 ENC-5V
13 YH
14 ENC-5V
15 B-Y
16 R-Y
To DIGITAL BOARD ---CN2
IC4 COLOR MODULATOR /ENCODER
HC-CONT1
HC-LEVEL
R-Y.BIN
AGCDETIN
LC-LEVEL
R-Y.BOUT
FADE
PULSE
LAP.LEV
Y(D) IN
Y+AP.OUT
LHAP.LEV
B-Y.GAIN
BURST.R
R-Y IN
CR ADD
B-Y.IN
REF1.73
F.Y+APIN
PED
V.OUT
C+BR.IN
SYNC.IN
SYNC.LEV
R-Y GAIN
BURST.CR
SC.R
SC.B
BFP
GND
DC-CONT
HC-CONT2
VAP.IN
VCC
Y.IN
B-Y.BOUT
BCAR BAL
B-Y.BIN
RCAR.BAL
F.Y+APO
R-Y
B-Y
YH
Q10
Q11
D1
CF3
GND
L7 8R2 uH
R66 102
R67 102
R79 102
R86 105
R89(J)0R00
R92 912
R90 113
R91 102
R83 102
R97 222
R95 102
R75 102
R80 181
R88 272
R84 821
CF6
R110 102
R113 153
R102 153
R103 391
R107(J) 0R00
R211 102
R212 272
R124 0R00
R129 0R00
R132 431
R123(J) 0R00
(J)R120 0R00
C50 CCS 104FZ
C49 CCS
C24 103XK
C77 22/35V
C25 103XK
C28 103XK
C51 104FZ
C26 270CHJ
C52 CCS 104FZ
C36 CCS
C32 104FZ
C33 CCL 104XK
C34 104FZ
C35 104FZ
C79 33/4C
C76 15/10C
C78 15/10C
C53 3.3/6.3V
C54 104FZ CCS
GND
CARR.ADD
BURSTLEVEL
HUE
D/A CONVERTER
IC5
VSS
GND
CN1
S.DATA
⑤
⑥
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳

SYNC BOARD

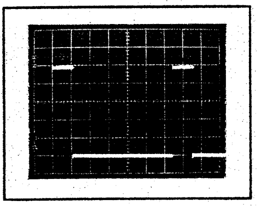
IC4	D6
IC5	C6
IC7	D3
IC8	B7
IC9	C5
IC10	D4
IC11	E3
Q2	C2
Q3	C3
Q10	E6
Q11	C5
Q29	B6
Q45	A7
Q46	B5
Q47	B5
Q48	C5
Q49	B4
D1	B5
D2	E3
D3	E3
D6	B3
D7	B4
D8	B5
D9	B5
D10	B4
D11	B4


D/A CONVERTER
IC5
VSS
AO3
AO4
AO5
AO6
AO7
AO8
AO9
AO10
VDD
GND
AO2
AO1
DI
CLK
LD
DO
AO11
AO12
VCC
IC9
C90 104FZ
C91 510CHJ
C81 10/16C
8R2 uH L11
C94 10/250
GND
D10
R205 472
C98 224FZ
Q47
C99 104FZ
Q46
D11
C97 47/16
D8
R216 221
D9
C95 47/16V
GND
L8 8R2 uH
LOWCLIP
R190 393
R188 392
R W/B.B W/B CONT.
R189 103
R192 103
IC8
C92 1/16Y
R191 392
C88 10/16V
C87 104FZ
R193 392
C89 1/16Y
R195 392
R194 393
C93 10/16V
Vref
SYNC FREQ.
H-PHASE
L9 8R2μH
C82 10/16C
R198 101
Q29
R182 362
R163 101
Q45
㉑
R183 911
R167 822
R196 222
R166 621
R170(J) 0R00
R168 202
C83 10/16V
CN1
1 S.DATA
2 S.CLK
3 D/A-CS
4 LOWCLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B-DET
12 GND
13 R-DET
14 GND
15 LL-DET
16 NT/PAL
To DIGITAL BOARD ---CN1
5
6
7
8

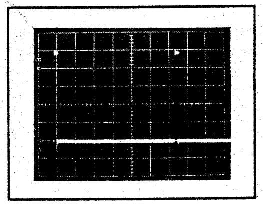
1. 10μsec/DIV,1V/DIV



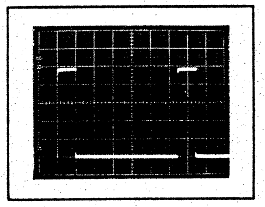
3. 10μsec/DIV,1V/DIV



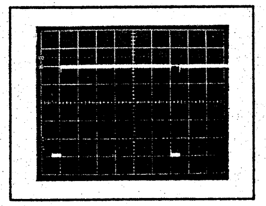
5. 10μsec/DIV,1V/DIV



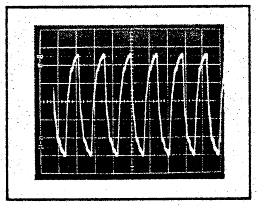
7. 10μsec/DIV,1V/DIV



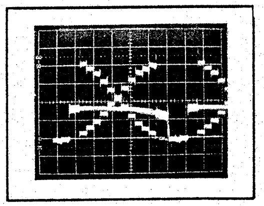
9. 10μsec/DIV,1V/DIV



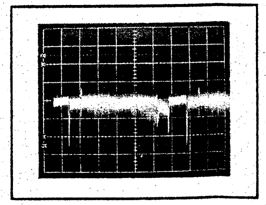
11. 0.2μsec/DIV,0.1V/DIV



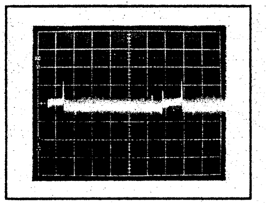
13. 10μsec/DIV,0.1V/DIV



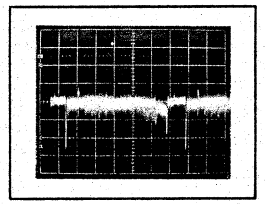
15. 10μsec/DIV,20mV/DIV



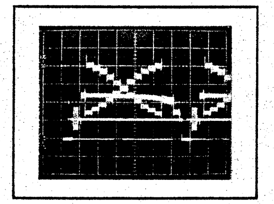
17. 10μsec/DIV,20mV/DIV



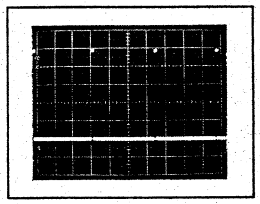
19. 10μsec/DIV,20mV/DIV



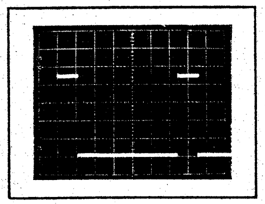
21. 10μsec/DIV,1V/DIV



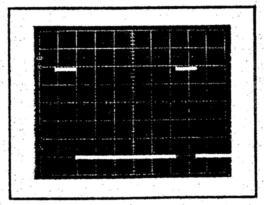
2. 5msec/DIV,1V/DIV



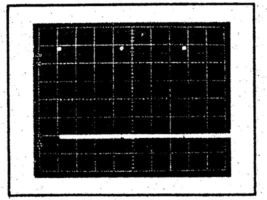
4. 10μsec/DIV,1V/DIV



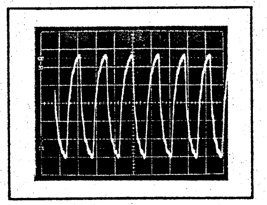
6. 10μsec/DIV,1V/DIV



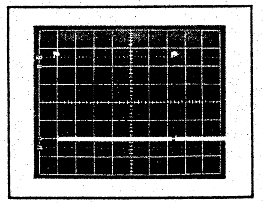
8. 5msec/DIV,1V/DIV



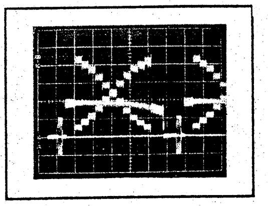
10. 0.2μsec/DIV,0.1V/DIV



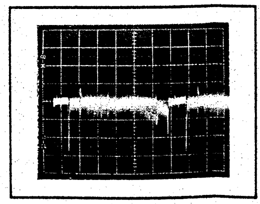
12. 10μsec/DIV,1V/DIV



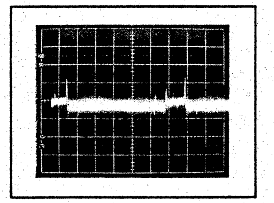
14. 10μsec/DIV,0.2V/DIV



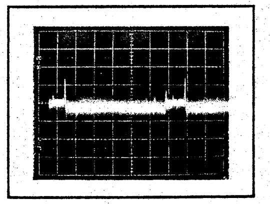
16. 10μsec/DIV,20mV/DIV



18. 10μsec/DIV,20mV/DIV



20. 10μsec/DIV,20mV/DIV



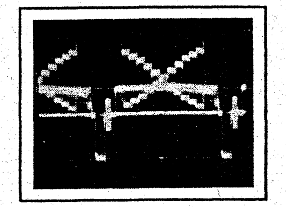
SCHEMATIC DIAGRAM OF VP BOARD

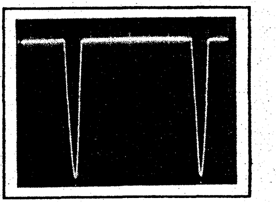
VP BOARD

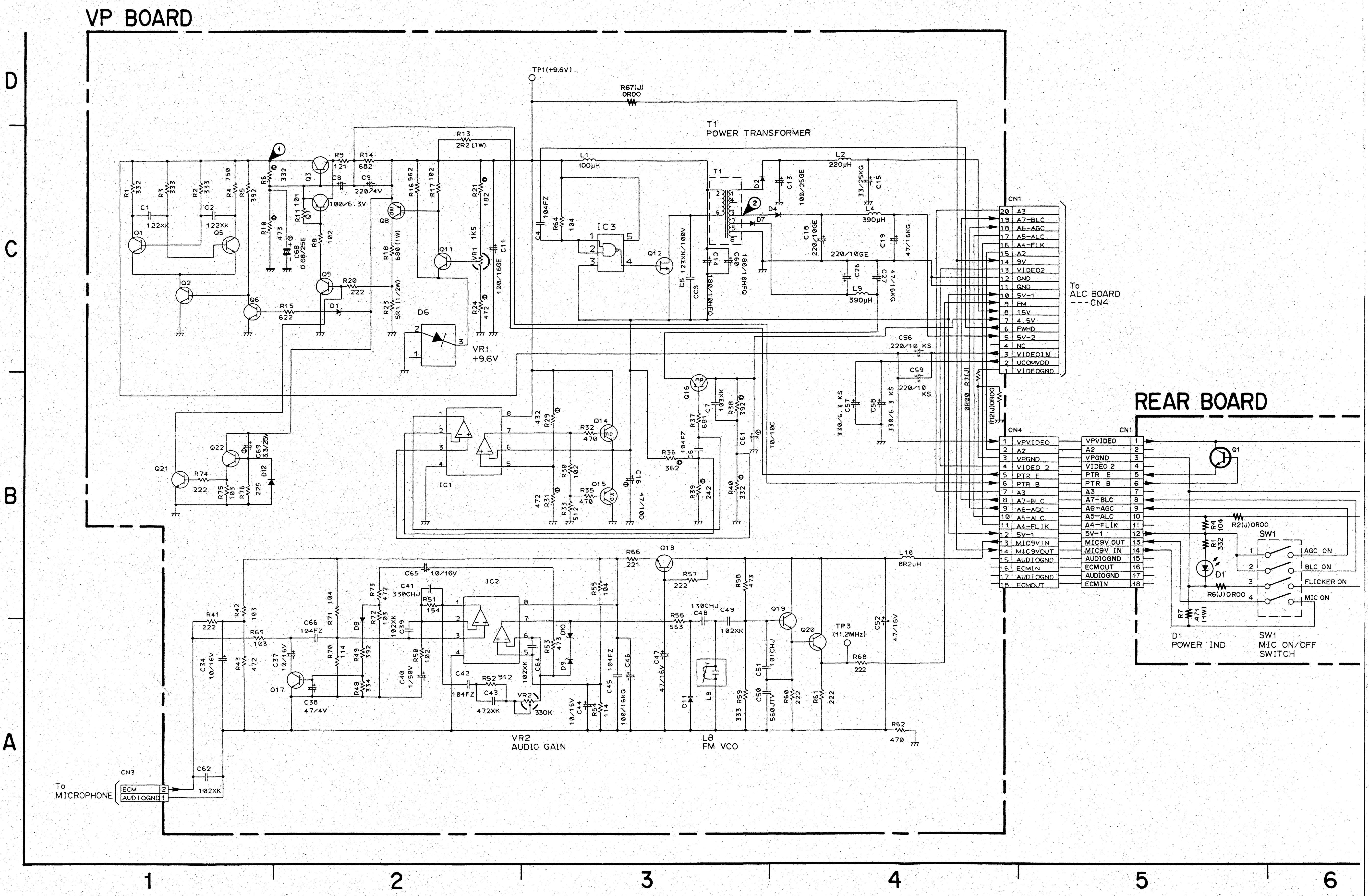
IC1	B2
IC2	B2
IC3	C3
Q1	C1
Q2	C1
Q3	C2
Q5	C1
Q6	C1
Q7	C2
Q8	C2
Q9	C2
Q11	C2
Q12	C3
Q14	B3
Q15	B3
Q16	B3
Q17	A2
Q18	B3
Q19	B4
Q20	A4
Q21	B1
Q22	B1
D1	C2
D2	C3
D4	C4
D6	C2
D7	C3
D8	A2
D9	A3
D10	A3
D11	A3
D12	B1

REAR BOARD

Q1	B5
D1	B5

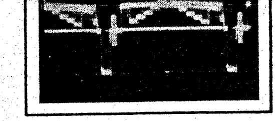

1. 10µsec/DIV, 0.2V/DIV


2. 10µsec/DIV, 10V/DIV

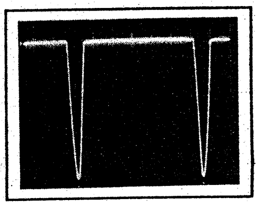

VP BOARD
REAR BOARD
D
C
B
A
1
2
3
4
5
6
TP1(+9.6V)
R67(J) 0R00
T1 POWER TRANSFORMER
R13 2R2(1W)
R9 121
R14 682
C8
C9 220/4V
100/6.3V
R1 332
R3 333
R2 333
R4 750
R5 392
R6 332
C1 122XK
C2 122XK
R10 473
R11 101
C68 0.68/25E
R8 102
R16 562
R17 102
R18 680(1W)
R21 182
VR1 1K5
C11 100/16GE
R20 222
R23 5R1(1/2W)
R24 472
R15 622
D1
D6
VR1 +9.6V
L1 100µH
C4 104FZ
R64 104
IC3
Q12
C5 123XK/100V
C14
C60 100/10HFO
L2 220µH
C13 100/25GE
C15
33/25KG
L4 390µH
C18 220/10GE
C19 47/16KG
C26
C27 47/16G
220/10GE
L9 390µH
D2
D4
D7
CN1
20 A3
19 A7-BLC
18 A6-AGC
17 A5-ALC
16 A4-FLK
15 A2
14 9V
13 VIDEO2
12 GND
11 GND
10 5V-1
9 FM
8 15V
7 4.5V
6 FWHD
5 5V-2
4 NC
3 VIDEOIN
2 UCOMVDD
1 VIDEOGND
To ALC BOARD ---CN4
C56 220/10 KS
C59 220/10 KS
C57 330/6.3 KS
C58 330/6.3 KS
R7(J) 0R00
R2(J) 0R00
IC1
R29 432
R32 470
Q14
Q15
R35 470
R30 102
R31 472
R33 512
C16 47/10D
Q16
C7 103XK
R37 681
R38 392
R36 362
C6 104FZ
C61
10/10C
R39 242
R40 332
Q22
C69 3.3/25V
D12
Q21
R74 222
R75 103
R76 225
CN4
1 VPVIDEO
2 A2
3 VPGND
4 VIDEO 2
5 PTR E
6 PTR B
7 A3
8 A7-BLC
9 A6-AGC
10 A5-ALC
11 A4-FLIK
12 5V-1
13 MIC9VIN
14 MIC9VOUT
15 AUDIOGND
16 ECMIN
17 AUDIOGND
18 ECMOUT
CN1
VPVIDEO 1
A2 2
VPGND 3
VIDEO 2 4
PTR E 5
PTR B 6
A3 7
A7-BLC 8
A6-AGC 9
A5-ALC 10
A4-FLIK 11
5V-1 12
MIC9V OUT 13
MIC9V IN 14
AUDIOGND 15
ECMOUT 16
AUDIOGND 17
ECMIN 18
Q1
R4 104
R2(J)0R00
R1 332
SW1
AGC ON
BLC ON
FLICKER ON
MIC ON
D1
R6(J)0R00
R7 471(1W)
D1 POWER IND
SW1 MIC ON/OFF SWITCH
R66 221
Q18
R57 222
L10 8R2µH
C65 10/16V
IC2
C41 330CHJ
R51 154
R73 472
R72 103
R71 104
C66 104FZ
R42 103
R41 222
R69 103
D8
C39 102XK
R70 114
R49 392
R50 102
R48 334
C37 10/16V
Q17
C38 47/4V
C40 1/50V
C42 104FZ
R52 912
C43 472XK
VR2 330K
C64 102XK
R53 473
D10
D9
R55 104
C45 104FZ
C44 10/16V
R54 114
C46 100/16KG
C47 47/16V
R56 563
C48 130CHJ
C49 102XK
R58 473
D11
L8
R59 333
C51 101CHJ
C50 560JTV
R60 222
Q19
Q20
R61 222
TP3 (11.2MHz)
R68 222
C52 47/16V
R62 470
VR2 AUDIO GAIN
L8 FM VCO
C34 10/16V
R43 472
C62 102XK
CN3
ECM 2
AUDIOGND 1
To MICROPHONE

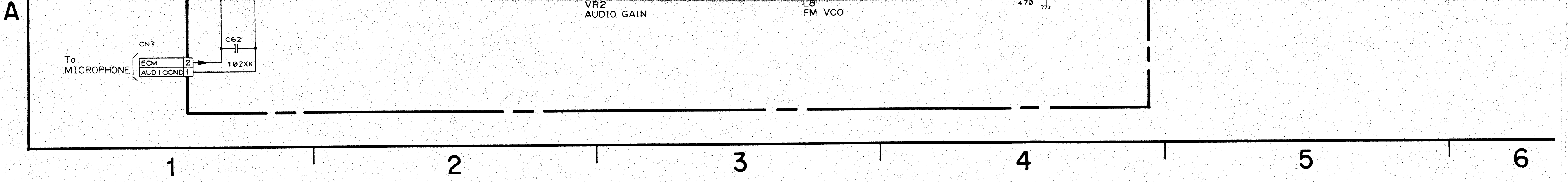
VP BOARD

IC1	C5



2. 10μsec/DIV, 10V/DIV



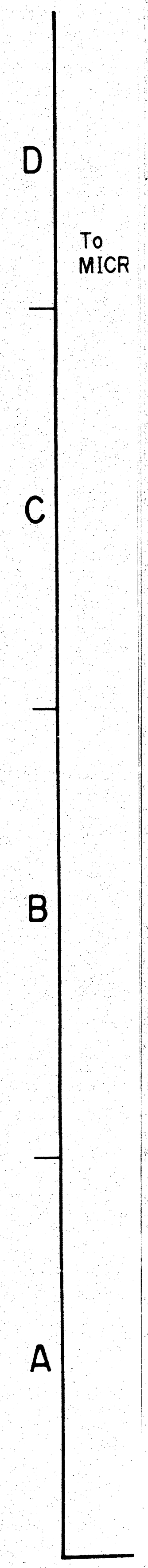


VP BOARD

IC1	C5
IC2	C6
IC3	D4
Q1	C6
Q2	D6
Q3	D5
Q5	C6
Q6	D5
Q7	D5
Q8	C2
Q9	D5
Q11	C2
Q12	C3
Q14	C3
Q15	C3
Q16	C5
Q17	D6
Q18	B6
Q19	C6
Q20	B6
Q21	C1
Q22	D1
D1	D5
D2	C5
D4	C5
D6	D5
D7	C4
D8	C6
D9	C6
D10	C6
D11	C1
D12	D1

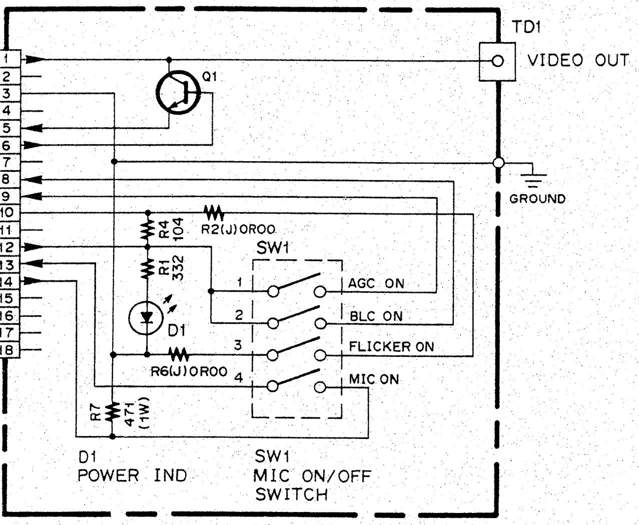
REAR BOARD

Q1	A2
D1	A2



CONDUCTOR VIEW OF VP BOARD

REAR BOARD


TD1
VIDEO OUT
Q1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
GROUND
R4 104
R2(J)0R00
R1 332
SW1
1
2
3
4
AGC ON
BLC ON
FLICKER ON
MIC ON
D1
R6(J)0R00
R7 471 (1W)
D1
POWER IND
SW1
MIC ON/OFF
SWITCH

5

6

VP BOARD

IC1 C5

VP BOARD

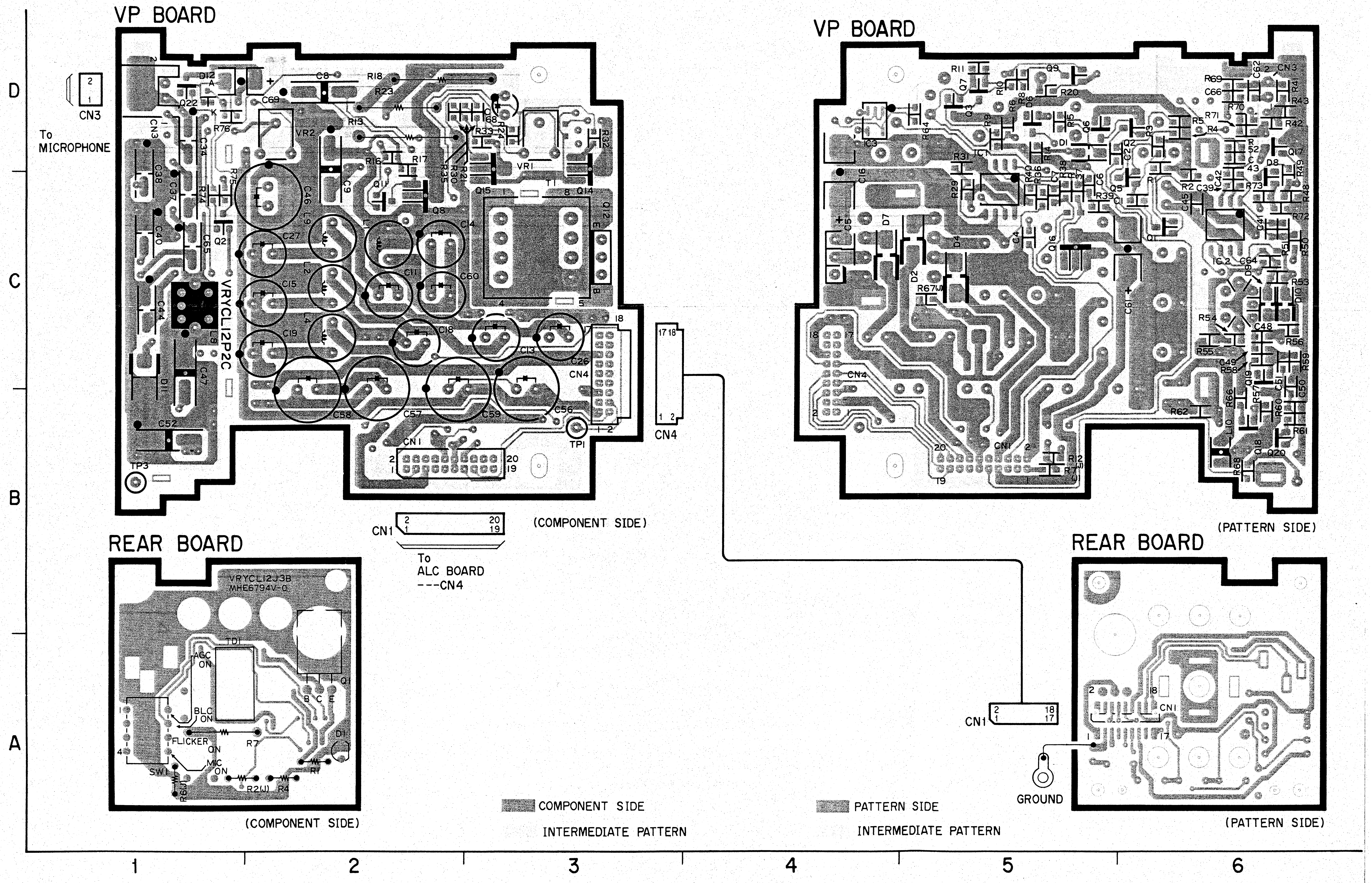
VP BOARD

VP BOARD

IC1	C5
IC2	C6
IC3	D4
Q1	C6
Q2	D6
Q3	D5
Q5	C6
Q6	D5
Q7	D5
Q8	C2
Q9	D5
Q11	C2
Q12	C3
Q14	C3
Q15	C3
Q16	C5
Q17	D6
Q18	B6
Q19	C6
Q20	B6
Q21	C1
Q22	D1
D1	D5
D2	C5
D4	C5
D6	D5
D7	C4
D8	C6
D9	C6
D10	C6
D11	C1
D12	D1

REAR BOARD

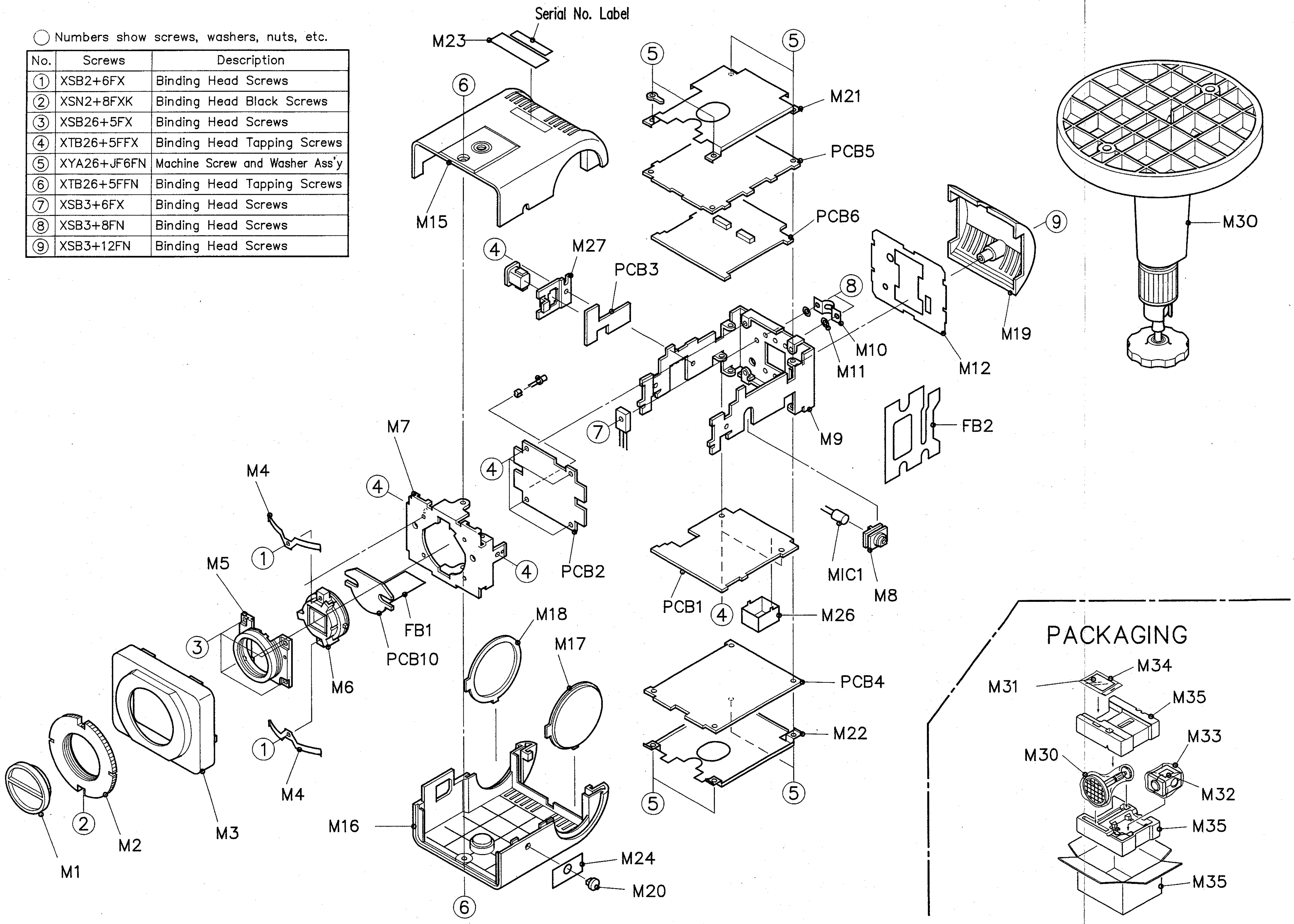
Q1	A2
D1	A2


VP BOARD
(COMPONENT SIDE)
VP BOARD
(PATTERN SIDE)
REAR BOARD
(COMPONENT SIDE)
REAR BOARD
(PATTERN SIDE)
To MICROPHONE
CN3
CN4
CN1
To ALC BOARD ---CN4
VRYCL12P2C
VRYCL12J3B
MHE6794V-0
TP1
TP3
VR1
VR2
T1
AGC ON
BLC ON
FLICKER ON
MIC ON
SW1
TD1
GROUND
COMPONENT SIDE
INTERMEDIATE PATTERN
PATTERN SIDE
INTERMEDIATE PATTERN
D
C
B
A
1
2
3
4
5
6

EXPLODED VIEW

○ Numbers show screws, washers, nuts, etc.

No.	Screws	Description
①	XSB2+6FX	Binding Head Screws
②	XSN2+8FXK	Binding Head Black Screws
③	XSB26+5FX	Binding Head Screws
④	XTB26+5FFX	Binding Head Tapping Screws
⑤	XYA26+JF6FN	Machine Screw and Washer Ass'y
⑥	XTB26+5FFN	Binding Head Tapping Screws
⑦	XSB3+6FX	Binding Head Screws
⑧	XSB3+8FN	Binding Head Screws
⑨	XSB3+12FN	Binding Head Screws


Serial No. Label
M23
⑥
M15
⑤
⑤
M21
PCB5
PCB6
M30
⑨
M19
M12
④
M27
PCB3
⑧
M10
M11
M9
⑦
FB2
M7
④
M4
①
M5
④
④
PCB2
PCB1
④
M26
MIC1
M8
FB1
PCB10
M6
③
M3
M2
②
M1
①
M4
M18
M17
PCB4
M22
⑤
⑤
M16
M24
M20
⑥
PACKAGING
M34
M31
M35
M33
M30
M32
M35
M35

REPLACEMENT PARTS LIST

Important Notice

1. Components identified by "⚠" mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.

REF.NO.	PART NO.	DESCRIPTION
MISCELLANEOUS		
MIC1	YWVAKA0918AN	Mic Unit Assy
FB1	YWCL320	Flexible Wire Board
M1	YWBC-2B	Body Cap
M2	YWV3FA0106A4	FB Control Ring
M3	YWV5BA0089B2	Front Escutcheon
M4	YWV4JA0379A4	Spring Plate
M5	YWV2TA0259A3	Mounting Bracket
M6	YWV0EA0195AN	Head Opitical Assy
M7	YWV2KA0712A3	Front Chassis
M8	YWV2FA0546A4	Mic Cushion
M9	YWV2KA0713A2	Rear Chassis
M10	YFV2GA0008A4	Cord Clamp
M11	YWV1KA0131A4	Washer
M12	YWV5WB1280A4	Rear Panel
M15	YWV5KA1170B2	Upper Case
M16	YWV5KA1171B2	Bottom Case
M17	YWV7QB2631A3	Right Side Label
M18	YWV7QB2632A3	Left Side Label
M19	YWV5EA1061A3	Rear Cover
M20	YWV5GC0068A4	Volume Cap
M21	YWV2HA1011A4	Shield Parts
M22	YWV2HA1012A4	Shield Parts
M23	YFV7MB0099A4	Safety Label
M24	YWV7SA1622A4	Mic Volume Label

REF.NO.	PART NO.	DESCRIPTION	
VP BOARD			
PCB1 (NLA)	YWVKYCL12E2A	Printed Circuit Board Assy	
IC1	NJM2904M	IC	
IC2	NJM4560M	IC	
IC3	YWTC4S11F	IC	
Q1	2SD1819-QRS	Transistor	
Q2	2SD1820-QRS	Transistor	
Q3	2SD1819-QRS	Transistor	
Q5	2SD1820-QRS	Transistor	
Q6	2SD1819-QRS	Transistor	
Q7	2SB1218A-QR	Transistor	
Q8	2SB766-RS	Transistor	
Q9,11	2SD1819-QRS	Transistor	
Q12	2SK612	FET	
Q14	2SD874-RS	Transistor	
Q15,16	2SB766-RS	Transistor	
Q17,18	2SD1819-QRS	Transistor	
Q19,20	2SC3931-CD	Transistor	
Q21,22	2SD1819-QRS	Transistor	
D1	MA8051	Diode	
D2,4	YWF1H4TP	Diode	
D6	YWRD6R2MB1	Diode	
D7	YWF1H4TP	Diode	
D8	MA142K	Diode	
D9,10	MA8030	Diode	
D11	MA338	Diode	
D12	YWDA120	Diode or	
	MA132A	Diode	
R1	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R2,3	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R4	ERJ3GEYJ750	Carbon	75 ohms 1/16W
R5	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R6	YWR0816P332D	Metal	3.3K ohms
R7	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R8	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R9	ERJ3GEYJ121	Carbon	120 ohms 1/16W
R10	YWR0816R473D	Metal	47K ohms
R11	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R12	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R13	ERX1ANJ2R2	Metal	2.2 ohms 1W
R14	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R15	ERJ3GEYJ622	Carbon	6.2K ohms 1/16W
R16	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R17	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R18	ERG1SJ680	Metal	68 ohms 1W
R20	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R21	YWR0816P182D	Metal	1.8K ohms
R23	ERX12SJ5R1	Metal	5.1 ohms 1/2W
R24	YWR0816P472D	Metal	4.7K ohms
R29	YWR0816P432D	Metal	4.3K ohms
R30	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R31	YWR0816P472D	Metal	4.7K ohms
R32	ERJ3GEYJ470	Carbon	47 ohms 1/16W
R33	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R35	ERJ3GEYJ470	Carbon	47 ohms 1/16W
R36	YWR0816P362D	Metal	3.6K ohms
R37	ERJ3GEYJ681	Carbon	680 ohms 1/16W
R38	YWR0816P392D	Metal	3.9K ohms
R39	YWR0816P242D	Metal	2.4K ohms
R40	YWR0816P332D	Metal	3.3K ohms
R41	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R42	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R43	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R48	ERJ3GEYJ334	Carbon	330K 1/16W
R49	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R50	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R51	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R52	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R53	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R54	ERJ3GEYJ114	Solid Resistor	11K ohms 1/16W
R55	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R56	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R57	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R58	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R59	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R60,61	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R62	ERJ3GEYJ470	Carbon	47 ohms 1/16W
R64	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R66	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R67	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R68	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R69	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R70	ERJ3GEYJ114	Solid Resistor	11K ohms 1/16W
R71	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R72	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R73	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R74	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R75	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R76	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
VR1	EVML1GA00BC3	Variable Resistor	1.5K ohms
VR2	EVML1GA00BY5	Variable Resistor	330K ohms
C1,2	YW5X122K5VB	Ceramic	1200 pF
C4	YW5F104Z2VB	Ceramic	0.1 µF
C5	YW400A123XKS	Ceramic	0.012 µF
C6	YW5F104Z2VB	Ceramic	0.1 µF
C7	YW5X103K2VB	Ceramic	0.01 µF
C8	ECEV0JV101	Electrolytic	100 µF 6.3V
C9	ECEV0GV221	Electrolytic	220 µF 4V
C11	ECEA1CGE101	Electrolytic	100 µF 16V
C13	ECEA1EGE101	Electrolytic	100 µF 25V
C14	ECA1AFQ181	Electrolytic	180 µF 10V

REF.NO.	PART NO.	DESCRIPTION	
C15	ECEA1EKG330	Electrolytic	33 µF 25V(KG)
C16	ECST1AD476ZR	Tantalum	47 µF 10V
C18	ECEA1AGE221	Electrolytic	220 µF 10V
C19	ECEA1CKG470	Electrolytic	47 µF 16V
C26	ECEA1AGE221	Electrolytic	220 µF 10V
C27	ECEA1CKG470	Electrolytic	47 µF 16V
C34,37	ECEV1CV100	Electrolytic	10 µF 16V
C38	ECEV0GV470	Electrolytic	47 µF 4V
C39	YW5X102K5VB	Ceramic	1000 pF
C40	ECEV1HV010SR	Electrolytic	1 µF 50V
C41	YW5CH330J5VB	Ceramic	33 pF
C42	YW5F104Z2VB	Ceramic	0.1 µF
C43	YW5X472K2VB	Ceramic	4700pF
C44	ECEV1CV100	Electrolytic	10 µF 16V
C45	YW5F104Z2VB	Ceramic	0.1 µF
C46	ECEA1CKG101	Electrolytic	100 µF 16V
C47	ECEV1CV470	Electrolytic	47 µF 16V
C48	YW5CH130J5VB	Ceramic	13 pF (CH)
C49	YW5X102K5VB	Ceramic	1000 pF
C50	YW5RH560J5VB	Ceramic	56 pF
C51	YW5CH101J5VB	Ceramic	100 pF
C52	ECEV1CV470	Electrolytic	47 µF 16V
C56	ECEA1AKS221	Electrolytic	220 µF 10V(KS)
C57,58	ECEA0JKS331	Electrolytic	330 µF 6.3V
C59	ECEA1AKS221	Electrolytic	220 µF 10V(KS)
C60	ECA1AFQ181	Electrolytic	180 µF 10V
C61	ECST1AC106	Tantalum	10 µF 10V
C62,64	YW5X102K5VB	Ceramic	1000 pF
C65	ECEV1CV100	Electrolytic	10 µF 16V
C66	YW5F104Z2VB	Ceramic	0.1 µF
C68	ECSF1VE684	Tantalum	0.68 µF 35V
C69	ECST1EB335	Tantalum	3.3 µF 25V
L1	YW664D101K	Coil	100 µH
L2	YW664D221K	Coil	220 µH
L4	YW664D391K	Coil	390 µH
L8	YWTLC1441Z	Coil	440 µH
L9	YW664D391K	Coil	390 µH
L10	ELJFC8R2MF	Coil	8.2 µH
T1	ETE11K11AY	Power Transformer	
CN1	YW51746430	20-pin Connector	
CN3	YWS2BPHKS	2-pin Connector	
CN4	YW11746368	18-pin Connector	
TP1,3	YW32BM5A	Test-pin	
M26	YWV2HA1003A4	Shield Cover	

REF.NO.	PART NO.	DESCRIPTION
	REAR BOARD	
PCB2 (NLA)	YWVRYCL12J3B	Printed Circuit Board Assy
Q1	2SC1568-RST	Transistor
D1	LN277RPX	LED
R1	ERDS2TJ332	Carbon 3.3K ohms 1/4W
R4	ERDS2TJ104	Carbon 100K ohms 1/4W
R7	ERG1ANJ471	Metal 470 ohms 1W
SW1	YFKSD04	Slide Switch
CN1	YW41756358	Connector
J2,6	ERDS2TC0	Jumper Resistor
E1	YWV2QA0158A4	Electrode
E2	YWLH53	LED Spacer
E3	YWV2PA0485A4	Insulator for Terminal
E4	YWV1EA0225A4	Terminal Screw
	ALC BOARD	
PCB3	YWVRYCL12P4A	Printed Board
C3-5	YF400102XKT	Ceramic 1000 pF
L1-4	ELJFCR68MF	Coil
CN1	YW1746366	6-pin Connector
CN2	YFD4151N200	ALC Connector
CN3,4	YW21746360	20-pin Connector
M27	YWV2SA2008A4	Mounting Angle
	DRIVE BOARD	
PCB4 (NLA)	YWVKBCL12E1A	Printed Circuit Board Assy
IC1	YWTC7S32FR	IC
IC2	YWCXA1439M	IC
IC3	MN53003LBJ	IC
IC6	YWMB621488U	IC
IC7	YWUPD16501GS	IC
IC8,9	MN13821P	IC
IC10	NJM3414M	IC
IC20,21	YWTC7S32FR	IC
IC22	AN8005	IC
Q1	2SC4619	Transistor or
	2SC4627	Transistor
Q2	2SC4619	Transistor or
	2SC4627	Transistor
Q3	2SC4619	Transistor or
	2SC4627	Transistor
Q4	2SC4617	Transistor or
	2SD2216	Transistor
Q6	2SK853	Transistor
Q13	2SC4617	Transistor or
	2SD2216	Transistor

REF.NO.	PART NO.	DESCRIPTION	
Q17	2SA1774	Transistor or	
	2SB1462	Transistor	
Q18	2SA1774	Transistor or	
	2SB1462	Transistor	
Q19	2SC4617	Transistor or	
	2SD2216	Transistor	
Q20	2SC4617	Transistor or	
	2SD2216	Transistor	
Q21	2SC4617	Transistor or	
	2SD2216	Transistor	
Q22	2SC4617	Transistor or	
	2SD2216	Transistor	
Q23	2SA1774	Transistor or	
	2SB1462	Transistor	
Q24	2SC4617	Transistor or	
	2SD2216	Transistor	
Q33	2SA1774	Transistor or	
	2SB1462	Transistor	
Q34	2SA1774	Transistor or	
	2SB1462	Transistor	
Q35	2SA1774	Transistor or	
	2SB1462	Transistor	
Q36	2SA1774	Transistor or	
	2SB1462	Transistor	
Q38	2SC4617	Transistor or	
	2SD2216	Transistor	
Q39	2SA1774	Transistor or	
	2SB1462	Transistor	
D1	YWDA121	Diode or	
	MA132K	Diode	
D4	YWDA221	Diode or	
	MA133	Diode	
D5	YWDTZ11	Diode or	
	MA8110	Diode	
D6	YWDTZ20	Diode or	
	MA8200	Diode	
D7,8	MA372	Diode	
D11	YWDA121	Diode or	
	MA132K	Diode	
D12	YWDA121	Diode or	
	MA132K	Diode	
R1	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R2,3	ERJ3GEYJ911	Carbon	910 ohms 1/16W
R4	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R5,7	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R9	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R10	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R11	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R12	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R13	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R14	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R15	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R16	ERJ3GEYJ182	Carbon	1.8K ohms 1/16W
R18	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R21	ERJ3GEY0R00	Carbon	0 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R22	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R24	ERJ3GEYJ302	Carbon	3K ohms 1/16W
R26	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R27	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R29	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R32	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R33,34	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R36	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R37	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R40,43	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R44,45	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R48	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R49	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R50	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R51,52	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R54,58	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R61,63	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R66,68	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R70	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R76	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R81,82	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R85	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R86	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R87,88	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R90,91	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R94	ERJ3GEYJ203	Carbon	20K ohms 1/16W
R96	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R101	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R104	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R109,112	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R113	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R114	ERJ3GEYJ620	Carbon	62 ohms 1/16W
R115	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R116	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R117	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R118	YWR0816P302D	Metal	3Kohms
R119	YWR0816P153D	Metal	15Kohms
R120	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R121	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R122	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R123	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R124	YWR0816P472D	Metal	4.7K ohms
R125	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R130	YWR0816P242D	Metal	2.4K ohms
R131	YWR0816P153D	Metal	15Kohms
R132	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R134	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R136	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R137	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R138	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R139	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R140	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R141	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R142	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R143	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R144	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R145,146	YWR0816P103D	Metal	10K ohms
R147	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R148	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R150	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R153,154	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R155,156	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R160	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R213	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R214	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R215	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R216	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R217	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R219,220	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R221,222	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R228	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R229	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R232	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R235,236	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R238,244	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R247	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R248	YF2116100JT	Carbon	10 ohms 1/10W
R249	YF21160R00T	Carbon	0 ohms 1/16W
R250,251	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R254	ERJ3GEY0R00	Carbon	0 ohms 1/16W
C5,6	YW5CH100J5VB	Ceramic	10 pF
C7	YW5X103K2VB	Ceramic	0.01 µF
C8	YW5X102K5VB	Ceramic	1000 pF
C9	YW5CH101J5VB	Ceramic	100 pF
C10	YW5CH331J5VB	Ceramic	330 pF
C12	YW5F104Z2VB	Ceramic	0.1 µF
C13	YW5CH331J5VB	Ceramic	330 pF
C26	YF400224FZT	Ceramic	0.22 µF
C33,35	YF400104FZT	Ceramic	0.1 µF
C36	YF400104FZT	Ceramic	0.1 µF
C37	ECEV1CV470	Electrolytic	47 µF 16V
C38	ECEV1CV100	Electrolytic	10 µF 16V
C39	ECST1VY104ZR	Tantalum	0.1 µF 35V
C40	ECST1DC106	Tantalum	10 µF 20V
C41	ECST1CC106ZR	Tantalum	10 µF 16V
C43	ECEV1CV100	Electrolytic	µF 16V
C44,45	ECST1CC106ZR	Tantalum	10 µF 16V
C46	ECEV1HV2R2SR	Electrolytic	2.2 µF 50V
C54	ECEV1CV470	Electrolytic	47 µF 16V
C56	ECST1CC106ZR	Tantalum	10 µF 16V
C57	ECST1VD685	Tantalum	6.8 µF 35V
C60	ECST1AB106	Tantalum	10 µF 10V
C62	ECEV1HV100SP	Electrolytic	10 µF 50V
C63	ECEV1EV220	Electrolytic	22 µF 25V
C68,70	ECEV1CV470	Electrolytic	47 µF 16V
C72	ECST0GY106	Tantalum	10 µF 4V
C74	ECST1CY105ZR	Tantalum	1 µF 16V
C77	YW5F473Z2VB	Ceramic	0.047 µF
C78	YW5X222K5VB	Ceramic	2200 pF
C79,81	YW5F104Z2VB	Ceramic	0.1 µF

REF.NO.	PART NO.	DESCRIPTION	
C82,83	ECEV1CV100	Electrolytic	10 µF 16V
C95	ECEV1CV470	Electrolytic	47 µF 16V
C105	YW5CH101J5VB	Ceramic	100 pF
C107	YW5CH120J5VB	Ceramic	12 pF
C114	ECEV1CV470	Electrolytic	47 µF 16V
C115	ECEV1CV100	Electrolytic	10 µF 16V
C117	ECEV1HV4R7SP	Electrolytic	4.7 µF 50V
C118-120	YW5X102K5VB	Ceramic	1000 pF
C123,124	YW5X102K5VB	Ceramic	1000 pF
C125	YW5F104Z2VB	Ceramic	0.1 µF
C126	ECST1ED106ZR	Tantalum	10 µF 25V
C127	ECST1AD476ZR	Tantalum	47 µF 10V
C128	ECST1AC226	Tantalum	22 µF 10V
C129	ECST1AB106	Tantalum	10 µF 10V
L1,5	ELJFC8R2MF	Coil	8.2 µH
L6,10	ELJFC8R2MF	Coil	8.2 µH
L12	EIC4EJ004E	Coil	
L15,18	ELJFC8R2MF	Coil	8.2 µH
CF1	ELB4B532	Filter	
CN1	YW523961490	14-pin Connector	
CN2	YW522051890	18-pin Connector	
CN3	YW522051490	14-pin Connector	
CN4	YW31756356	6-pin Connector	
CN6	YW51756430	20-pin Connector	
CN7	YW522051890	18-pin Connector	
TP1,4	YWRCT2125TPV	Test Point	
TP5	YWRCT2125TPV	Test Point	

DIGITAL BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB5 (NLA)	YWVKCCL12E1A	Printed Circuit Board Assy	
IC1	AN2015FAP	IC	
IC2,3	NJM4558M	IC	
IC6	YWCXD1175AM	IC	
IC7	YWM6M80021FP	IC	
IC8	MN6730FHP	IC	
IC9	MN6731FHP	IC	
IC10	MN188166CUG	IC	
IC12	MN65701FHP	IC	
IC13	MN53020LB01	IC	
Q8	2SC4617	Transistor or	
	2SD2216	Transistor	
Q9	2SA1774	Transistor or	
	2SB1462	Transistor	
Q10	2SA1774	Transistor or	
	2SB1462	Transistor	

REF.NO.	PART NO.	DESCRIPTION	
Q11	2SC4617	Transistor or	
	2SD2216	Transistor	
Q14	2SC4617	Transistor or	
	2SD2216	Transistor	
Q15	2SC4617	Transistor or	
	2SD2216	Transistor	
Q16	2SC4617	Transistor or	
	2SD2216	Transistor	
Q17	2SC4617	Transistor or	
	2SD2216	Transistor	
Q18-21	FA3L4ZT1B	Transistor	
Q26	2SA1774	Transistor or	
	2SB1462	Transistor	
Q27	2SC4617	Transistor or	
	2SD2216	Transistor	
D2	YWDA221	Diode or	
	MA133	Diode	
D3	YWDA221	Diode or	
	MA133	Diode	
D4	YWDA221	Diode or	
	MA133	Diode	
TH215	L311F431J502	Thermistor	
R9	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R19	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R20	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R21	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R23	ERJ3GEYJ112	Carbon	1.1K ohms 1/16W
R25	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R28	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R30	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R31	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R33	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R34,36	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R37	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R38-41	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R42-44	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R45,46	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R47	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R48	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R50	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R53	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R56	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R58,59	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R68,69	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R72,73	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R76	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R77	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R78,79	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R82,85	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R94	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R95	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R96	YWR0816P221D	Metal	220 ohms
R97	YWR0816P102D	Metal	1K ohms
R98	YWR0816Q560D	Metal	56 ohms
R99	ERJ3GEY0R00	Carbon	0 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R100,101	YWR0816P221D	Metal	220 ohms
R104	YWR0816P472D	Metal	4.7K ohms
R105	YWR0816P562D	Metal	5.6K ohms
R106,113	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R114	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R115	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R116	ERJ3GEYJ271	Carbon	270 ohms 1/16W
R117	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R118-120	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R122	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R123	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R133,136	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R137-148	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R150-157	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R158	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R159	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R160	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R161	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R162	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R163,164	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R168-180	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R184,185	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R186	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R187	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R188	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R189	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R190	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R191	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R192	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R193	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R194	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R196	ERJ3GEYJ2R2	Carbon	2.2 ohms 1/16W
R197	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R198	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R199	ERJ3GEYJ181	Carbon	180 ohms 1/16W
R201,204	YF21160R00T	Carbon	0 ohms 1/16W
R207-213	YF21160R00T	Carbon	0 ohms 1/16W
R214	ERJ3GEYJ104	Carbon	100K ohms 1/16W
Z1-6	EXBV8V470J	Block Resistor	
C3	YW5F473Z2VB	Ceramic	0.047 µF
C6-8	YW5CH120J5VB	Ceramic	12 pF
C9	YW5CH151J5VB	Ceramic	150 pF
C10	YW5CH101J5VB	Ceramic	100 pF
C12	YW5CH120J5VB	Ceramic	12 pF
C15	YW5CH330J5VB	Ceramic	33 pF
C16	YW5CH151J5VB	Ceramic	150 pF
C17	YW5X102K5VB	Ceramic	1000 pF
C18	YW5CH120J5VB	Ceramic	12 pF
C20	YW5CH150J5VB	Ceramic	15 pF
C21	YW5CH101J5VB	Ceramic	100 pF
C22	YW5CH151J5VB	Ceramic	150 pF
C23	YW5F104Z2VB	Ceramic	0.1 µF
C27,29	YW5CH101J5VB	Ceramic	100 pF
C32,35	YW5F104Z2VB	Ceramic	0.1 µF
C36	YW400474FZ	Ceramic	0.47 µF

REF.NO.	PART NO.	DESCRIPTION	
C37	YW5F104Z2VB	Ceramic	0.1 µF
C38-40	YW5CH120J5VB	Ceramic	12 pF
C45	YW5F104Z2VB	Ceramic	0.1 µF
C46,47	YF400104FZT	Ceramic	0.1 µF
C48	ECST0JY335	Tantalum	3.3 µF 6.3V
C49,50	YF400103XKT	Ceramic	0.01 µF
C56	ECST0JY475	Tantalum	4.7 µF 6.3V
C57	ECST0JY685	Tantalum	6.8 µF 6.3V
C58	ECST1AB106	Tantalum	10 µF 10V
C59	ECST0GB226ZR	Tantalum	22 µF 4V
C60	ECST0JY475	Tantalum	4.7 µF 6.3V
C61	ECST0GY475Z	Tantalum	4.7 µF 4V
C62	ECST1DC685ZR	Tantalum	6.8 µF 20V
C63	ECST1CB475ZR	Tantalum	4.7 µF 16V
C64	ECST1AD476ZR	Tantalum	47 µF 10V
C65	ECST1VY104ZR	Tantalum	0.1 µF 35V
C67	ECST1AC106	Tantalum	10 µF 10V
C69	ECST1AB106	Tantalum	10 µF 10V
C70	ECST0GY106	Tantalum	10 µF 4V
C71	ECST1AB106	Tantalum	10 µF 10V
C72	ECST1CC106ZR	Tantalum	10 µF 16V
C73,75	ECST1AC106	Tantalum	10 µF 10V
C77,78	ECST1AC106	Tantalum	10 µF 10V
C80	ECST1AC106	Tantalum	10 µF 10V
C82	ECEV1CV100	Electrolytic	10 µF 16V
C83	ECST1AC106	Tantalum	10 µF 10V
C84-86	ECST1AC226	Tantalum	22 µF 10V
C87	ECST0JB106ZR	Tantalum	10 µF 6.3V
C88	ECST1AC106	Tantalum	10 µF 10V
C90,91	ECST1AB106	Tantalum	10 µF 10V
C92	ECST1AD476ZR	Tantalum	47 µF 10V
C93	YW5F104Z2VB	Ceramic	0.1 µF
C96	ECST1AY475	Tantalum	4.7 µF 10V
L1,2	ELJFC8R2MF	Coil	8.2 µH
L4	ELJFC8R2MF	Coil	8.2 µH
L7,8	ELJFC8R2MF	Coil	8.2 µH
L10,11	ELJFC8R2MF	Coil	8.2 µH
L13,14	ELJFC8R2MF	Coil	8.2 µH
L25	ELJFC8R2MF	Coil	8.2 µH
L30	ELJFC8R2MF	Coil	8.2 µH
X1	EF0V8004E0A	Crystal Oscillator	
CF4	ELB4A512	Filter	
CF5	EIK4EW001T	Filter	
CF6	EIK4EW002T	Filter	
CN1,2	YW71756436	16-pin Connector	
CN3,4	YW523961890	18-pin Connector	
CN5,6	YW31756316	6-pin Connector	

SYNC BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB6 (NLA)	YWVKDCL12E1A	Printed Circuit Board Assy	
IC4	AN2254FAP	LSI	
IC5	YWM62352GP	IC	
IC7	MN73069LBM2	IC	
IC8	NJM2903M	IC	
IC9	YWTC7S32FR	IC	
IC10	YWTC4S69F	IC	
IC11	YWTC7S04F	IC	
Q2,3	2SK662-PQR	FET	
Q10	2SA1774	Transistor or	
	2SB1462	Transistor	
Q11	2SA1774	Transistor or	
	2SB1462	Transistor	
Q29	2SC4617	Transistor or	
	2SD2216	Transistor	
Q45	UMX1	Transistor	
Q46	2SC4617	Transistor or	
	2SD2216	Transistor	
Q47	2SA1774	Transistor or	
	2SB1462	Transistor	
Q48	2SA1774	Transistor or	
	2SB1462	Transistor	
Q49	2SC4617	Transistor or	
	2SD2216	Transistor	
D1	YWDA120	Diode or	
	MA132A	Diode	
D2,3	MA372	Diode	
D6,7	MA372	Diode	
D8,9	MA729	Diode	
D10	YWDA120	Diode or	
	MA132A	Diode	
D11	YWDA120	Diode or	
	MA132A	Diode	
R9	ERJ3GEYJ112	Carbon	1.1K ohms 1/16W
R10	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R11,12	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R13	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R14	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R17	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R18	ERJ3GEYJ184	Carbon	180K ohms 1/16W
R19	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R27	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R28,29	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R30	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R32	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R33	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R34	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R35	ERJ3GEYJ162	Carbon	1.6K ohms 1/16W
R37	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R39	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R41,43	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R44	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R45,46	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R47	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R48,50	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R51,52	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R56	ERJ3GEYJ474	Carbon	470K ohms 1/16W
R66,67	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R71	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R75	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R77	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R79	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R80	YWR0816P181D	Metal	180 ohms
R82	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R83	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R84	YWR0816P821D	Metal	820 ohms
R85	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R86	ERJ3GEYJ105	Carbon	100K 1/16W
R88	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R89	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R90	ERJ3GEYJ113	Carbon	11K ohms 1/16W
R91	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R92	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R95	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R97	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R102	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R103	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R107	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R110	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R112	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R113	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R120,123	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R124,129	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R132	YF2116431JT	Carbon	430 ohms 1/16W
R144	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R148	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R163	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R166	YWR0816P621D	Metal	620 ohms
R167	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R168	ERJ3GEYJ202	Carbon	2K ohms 1/16W
R170	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R176,179	YWR0816P471D	Metal	470 ohms
R182	YWR0816P362D	Metal	3.6K ohms
R183	YWR0816P911D	Metal	910 ohms
R187	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R188	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R189	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R190	ERJ3GEYJ393	Carbon	39K ohms 1/16W
R191	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R192	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R193	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R194	ERJ3GEYJ393	Carbon	39K ohms 1/16W
R195	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R196	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R198	ERJ3GEYJ101	Carbon	100 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R199,200	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R203	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R204	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R205	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R206	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R208	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R209	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R211	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R212	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R213	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R214,215	YWR0816P332D	Metal	3.3K ohms
R216	ERJ3GEYJ221	Carbon	220 ohms 1/16W
C4,5	YW5CH620J5VB	Ceramic	62 pF
C6	YW5F104Z2VB	Ceramic	0.1 µF
C7	YW5CH121J5VB	Ceramic	120 pF
C8	YW5X103K2VB	Ceramic	0.01 µF
C9	YW5CH910J5VB	Ceramic	91 pF
C10	YW5CH750J5VB	Ceramic	75 pF
C12	YF400104FZT	Ceramic	0.1 µF
C21,23	YW5CH271J5VB	Ceramic	270 pF
C24,25	YW5X103K2VB	Ceramic	0.01 µF
C26	YW5CH270J5VB	Ceramic	27 pF
C28	YW5X103K2VB	Ceramic	0.01 µF
C32,33	YF426104XKS	Ceramic	0.1 µF
C34,35	YW5F104Z2VB	Ceramic	0.1 µF
C45	YW5X103K2VB	Ceramic	0.01 µF
C46	YW400393XKT	Ceramic	0.039 µF
C47,49	YF400104FZT	Ceramic	0.1 µF
C50-52	YF400104FZT	Ceramic	0.1 µF
C53	ECST0JY335	Electrolytic	3.3 µF 6.3V
C54,56	YF400104FZT	Ceramic	0.1 µF
C64,66	ECST1AC106	Tantalum	10 µF 10V
C67	ECEV1EV220	Electrolytic	22 µF 25V
C69	ECST0JB106ZR	Tantalum	10 µF 6.3V
C73	ECST1AC106	Tantalum	10 µF 10V
C74	ECST1CY105ZR	Tantalum	1 µF 16V
C76	ECST1AC156	Tantalum	15 µF 10V
C77	ECST1VY224Z	Tantalum	0.22 µF 35V
C78	ECST1AC156	Tantalum	15 µF 10V
C79	ECST0GC336ZR	Tantalum	33 µF 4V
C81,82	ECST1CC106ZR	Tantalum	10 µF 16V
C83	ECEV1CV100	Electrolytic	10 µF 16V
C86	YW5CH101J5VB	Ceramic	100 pF
C87	YW5F104Z2VB	Ceramic	0.1 µF
C88	ECEV1CV100	Electrolytic	10 µF 16V
C89	ECST1CY105ZR	Tantalum	1 µF 16V
C90	YW5F104Z2VB	Ceramic	0.1 µF
C91	YW5CH510J5VB	Ceramic	51 pF
C92	ECST1CY105ZR	Tantalum	1 µF 16V
C93	ECEV1CV100	Electrolytic	10 µF 16V
C94	ECST1ED106ZR	Tantalum	10 µF 25V
C95,97	ECEV1CV470	Electrolytic	47 µF 16V
C98	YF400224FZT	Ceramic	0.22 µF
C99	YW5F104Z2VB	Ceramic	0.1 µF
C100	YW5CH221J5VB	Ceramic	220 pF

REF.NO.	PART NO.	DESCRIPTION	
L1,3	ELJFC8R2MF	Coil	8.2 µH
L7-11	ELJFC8R2MF	Coil	8.2 µH
X1	YWDX17R734	Crystal Oscillator	
X2	YWDX14R187	Crystal Oscillator	
CF3	ELB4D537	Filter	
CF6	YWNL4532S4R4	Filter	
CN1,2	YW41756386	16-pin Connector	
CN3	YW523961490	14-pin Connector	
TP1,2	YWRCT2125TPV	Test Point	
TP7	YWRCT2125TPV	Test Point	

SENSOR BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB10	YWVRYCL32P1C	Printed Board	
Q1	2SC4617	Transistor or	
	2SD2216	Transistor	
Q2	2SC4618	Transistor or	
	2SC4618	Transistor	
D2	MA728	Diode	
R3	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R4	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R5	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R10-12	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R13	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R15	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R16	ERJ3GEYJ100	Carbon	10 ohms 1/16W
VR2	EVM7JGA30B14	Variable Resistor	10K ohms
C2,6	YW5F104Z2VB	Ceramic	0.1 µF
C7	YW5F104Z2VB	Ceramic	0.1 µF
C9	YF426104XKS	Ceramic	0.1 µF
C10	ECST1VX105ZR	Tantalum	1 µF 35V

ACCESSORY PARTS/PACKAGING PARTS

REF.NO.	PART NO.	DESCRIPTION
M30	YWVAKA0918AN	Camera Bracket Assy
M31	YWV8QA2718AN	Operating Instructions
M32	YFV7SA0295A4	Caution Label
M33	YWT20X25C03	Polyethylene Bag
M34	YWT20X35C03	Polyethylene Bag
M35	YWV9CA1766AN	Packaging Assy